INITIAL ASSESSMENT OF THE HUMAN EMBRYOS' DEVELOPMENT CULTURING IN MULTI-STEP VITROLIFE AND SINGLE-STEP LIFE GLOBAL AT THE REPRODUCTIVE ASSISTANCE CENTER - 16A HA DONG GENERAL HOSPITAL

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ABSTRACT

It is evident that embryologists always expect to achieve good-quality embryos when conducting IVF cycles. Besides, the modern techniques are always improved to enhance the quality of embryos and many culture environments are also constantly upgraded to optimize the development of embryos. In this study, we initially evaluated the development of 324 embryos from the zygote to the blastocyst in two types of environments that are Vitrolife and Life Global.

Objective: Compare the single-step culture of Life Global and mutli-step culture Vitrolife towards the development of the embryo from the zygote stage to the blastocyst.

Methods: Routine IVF stimulation and ICSI are performed with the zygote of patients randomly assigned, using the single step culture of Life Global and multiple steps culture of Vitrolife Media. Monitor the development of embryos on days 3 and 5, and the proportion of good embryos. Analysis by Chi-square and t-Test method. Besides, using the methods of document review, system analysis method and comprehensive evaluation method.

Results: The development of day 3 and 5 embryos did not differ significantly. However, the number of day 3 embryos with 6-10 cells and blastocysts ≥3BB are higher (p <0.05) when cultured in Global than Vitrolife (87,1% and 75%, respectively, compared to 72,6 % and 63,1%). Meanwhile, there were no significant differences in embryo development up to day 5 (75,5% when embryos were cultured by continuous culture and 74,3% when cultured embryos in stages).

Key words: *Embryos development; culture environment*

I.INTRODUCTION

The formation and development of embryos in nature are due to hormonal factors and the women's internal organ. First, the egg is fertilized at the position of the upper third of the ovary. After that, the zygote and the embryo are formed and move down and nest in the uterus. Every single step of development is different and the embryo will be exposed to different environmental systems, namely, epidermal fluid and uterine fluid. Therefore, when scientists develop embryo culture systems, it is essential for them to create the same environment that embryos are nourished in nature.

Currently, there are two types of environments applied in laboratories of Reproductive Assistance Centers. The first one is the daily culture of embryo development which is divided into three separate types of medium for each step of the

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embryo, namely, fertilization medium, cleavage medium, and blastocyst medium. The second one is a continuous single culture for embryo development by using an environment during all embryonic development stages.

In fact, type 1 of the environment called "multi-step culture medium" has been applied and is commonly used in all Reproductive Assistance Centers since the first years (1997). However, in recent years "single-step culture" has appeared and breathed a new life into the field of reproductive support. At laboratory's conditions in accordance with TCVN 8664-1: 2011 (equivalent to ISO 14644-1 standard), comparing the effectiveness of embryo culturing when cultured by multi-step Vitrolife culuture and single-step Life Global culuture. (Comparison of fertilization rate, development of embryos on day 3, development of embryos on day 5, the amount of good embryos developed).

II.SUBJECTS AND METHODS OF RESEARCH

2.1 Research subjects

- Two types of embryo culture medium:

+) Multi-step embryo culture environment of Vitrolife - Sweden

+) Single-step embryo culture environment of Life-Global - USA

- Randomly picking 324 embryos (164 embryos were cultured by multi-stage embryo culture, 160 embryos were cultured with continuous embryo culture) from 1/2018 to 5/2019 at the Reproductive Assistance Center - 16A General Hospital Ha Dong.

- Monitoring fertilization results of sperm and eggs and development on day 3 and 5 embryos, the amount of good embryos developed.

2.2. Research Methods

- Document review method

Learn, synthesize and review the general knowledge about the composition of embryo culture medium in the laboratory. Documents are related to environmental factors in laboratories in general and factors affecting embryos in particular.

- System analysis method

Handling and systematizing research datum and research objects for the process of building databases. Specifically, grouping of collected and statistic information such as Essential cultivating compounds, embryo culture time, VOCs, air factors affecting embryos and shape factor of embryo development day 1, day 3 day 5.

- General assessment method

On the basis of collected datum and the related research topics, conducting synthesis, statistics of numbers, evaluation of indicators and arguments. Comparing between continuous embryo culture and daily embryo culture in single-step of embryo development.

- Chi-square and t-Test method

After 10 to 14 days when the controlled ovarian was induced, the patient received an ultrasound capsule through ultrasound guidance (36 hours after hCG). Egg follicles are removed and transferred to the ART lab for 2 minutes, placed in an incubator for 2-4

hours to prepare cytoplasmic sperm injection (ICSI).

After ICSI, all oocytes were placed in one of the egg washing environments (containing 10% of the total serum substitute in 25 microdroplets). After overnight incubation, 324 fertilized zygotes were randomly divided into two different culture groups in two different media or Vitrolife. Environments were previously added to 5% recombinant human serum albumin. All embryo development in vitro was performed in the K-System G210 embryo culture cabinet. Each machine is controlled by adjusting pH of CO2 concentration (titration at 5.0 - 6.5%). All embryos undergo standard quality classification of day 3 to assess cell numbers, symmetry, fragmentation, and designation at level 1, type 2 and type 3. In addition, embryos were evaluated one more time and based on the following criteria which are Expansion of the embryo interval, ICM volume and leaf volume (according to the levels: good, quite good, medium). Embryos that are equal to and below 3BB are below average. Comparing embryo development groups with Chi-square and T-test analysis methods, the development relationship was used variance analysis method and correlative regression analysis.

III. RESULT

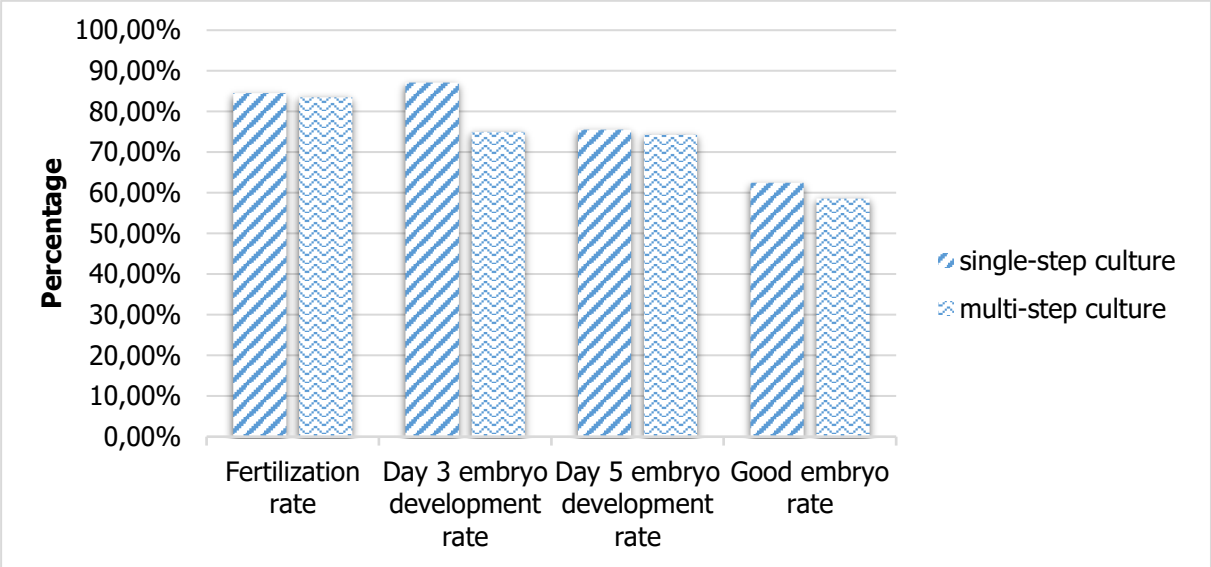

Chart 1: Comparison of embryonic development stages using a single-step culture (LifeGlobal) and a multi-step culture (Vitrolife).

Based on chart 1, it can be seen that although there is no significant comparison in the development of the embryo's each stage, the results show that when the Life Global environment (multi-step culture medium) is used, the embryo's development had a slight higher compared to when culturing embryo with the Vitrolife medium (single-step culture).

Table 1: Development of embryo's quality in each stage

	Life Global	Vitrolife	p-value
Zygote	164	160	
Day 3 (6-10 cells)	143 (87,1%)	120 (75%)	p < 0,05
% Good Embryos: Type 1	75,3	72,6	
% Quite good Embryos: Type 2	20,6	15,5	
Day 5 Blastocysts	124 (75,5%)	119 (74,3%)	p < 0,05
% Good Embryos - AA	62,5	58,6	p < 0,05
% Quite good Embryos - AB	43,4	42,1	
% Medium Embryos - BA	38,2	40,3	
Blastocysts ≥ Loại 3BB	10,5	15,6	
Number of embryos ≥ 3BB	119 (72,6%)	101 (63,1%)	p < 0,05

Looking at table 1, the number of day 3 embryos development and the amount of day 5 blastocysts ≥3BB is greater (p <0.05) when cultured with Life Global than Vitrolife. Meanwhile, there are no significant differences in embryo development up to day 5 (75.5% when embryo are cultured in single-step culture and 74.3% when embryos are cultured in multi-step culture).

The study randomly compared 324 embryos divided into 2 groups that were cultured in 2 types of environment, namely, Life Global medium (single-step culture) and Vitrolife environment (multi-step culture). There is not much difference in the quality of embryos on the 3rd day of embryo's development, but in general, Global environment has cultured the day 5 blastocysts which have better development and more beautiful morphology than its counterpart. The difference in blastocyst quality and external embryo has demonstrated that culturing embryos with the same environment can make embryos completely develop better than culturing them in separate multiple cultures. To sum up, the ability of fertilization and embryo development of the two types of environments is relatively similar to the previously published ratios. The differences in the chemical composition between the two types of environments have been evaluated and can explain the observed results.

REFERENCES

1. **Bartmann A, Amaral AT, Gonçalves L.** A descriptive study of culture media in Brazilian assisted reproduction clinics. JBRA Assit Reprod. 2016;20:107-111. doi: 10.5935/1518-0557.20160025
2. **Mantikou E, Youssef MA, van Wely M, van der Veen F, Al-Inany HG, Repping S, Mastenbroek S.** Embryo culture media and

IVF/ICSI success rates: a systematic review. Hum Reprod Update.

3. **Herrero J, Meseguer M (2013)** Selection of high potential embryos using time-lapse imaging: the era of morphokinetics.
4. **Hardarson T, Bungum M, Conaghan J, Meintjes M, Chantilis SJ, et al. (2015)** Noninferiority, randomized, controlled trial comparing embryo development using media developed for sequential or undisturbed culture in a time-lapse setup.
5. **Morbeck DE, Baumann NA, Oglesbee D (2017)** Composition of single-step media used for human embryo culture.

TREATMENT OF TWO- AND THREE-PART FRACTURES OF THE PROXIMAL HUMERUS WITH TITANIUM ELASTIS NAILING (TEN)

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ABSTRACT

Objective: To present the clinical and radiological results of a minimally invasive technique, the fixation of two- and three-part fractures of the proximal humerus according to the Neer Classification System, using the intramedullary bundle-wiring Hackethal technique. ***Subjects and Methods:*** The operations were performed with the Hackethal tech- nique (use of elastic titanium nails, Synthes) on 72 patients (38 males and 34 females) with two- and three-part fractures of the proximal humerus. In cases of two and three part fracture, we used to intramedullary insertion titanium elastic nails. The clinical results were assessed us- ing the Neer score and radiological assessment includ- ing the union and alignment of the proximal humerus. Pre- operative and postoperative CT scans were performed along with 3D reconstruction in all cases for diagnostic and prog- nostic significance. ***Results:*** All fractures united in an aver- age period of 26 months (range 6-70 months). In all patients, a good to excellent range of motion of the shoulder, and good to excellent muscular power and alignment were not- ed. Final functional outcome overage 69,2 %. There was no secondary loss of fixation and migra- tion of implants. ***Conclusion:*** In cases of two-part fracture of the proximal humerus, the minimally invasive Hackethal technique alone with two TEN and in cases of three-part fracture, the same technique with three TEN provided excellent clinical and radiological results with a minimal risk of complication. It is an important alternative to open reduc- tion and internal fixation of these difficult fractures.

Key Words: *Proximal humerus fracture, Minimally invasive fixation*

I. INTRODUCTION

Treatment of proximal humeral fractures remains a subject of debate, especially in older patients. Published randomized and comparative studies review a wide range of treatment methods [1, 2]. The problems involved in treatment decisions include type of fracture, bone quality and general condition of the patient. Several methods, including conservative treatment, variable forms of fixa- tion, and hemiarthroplasty have been proposed, but the long-term results have not always been satisfactory, and a new interest in finding a better therapeutic solution has been observed in recent years [3-9]. The introduction of locking plates with better fixation stability has improved the results of fixation, but since even these implants may fail, other fixation devices have been proposed [10]. The question whether stiff and rigid implants are better than elastic implants in these fractures remains unanswered and reports on experimental studies have not given un- equivocal results [11]. In this study, indirect reduction us- ing manipulation and the joystick technique combined with intramedullary fixation following the Hackethal method was applied. We report our results in an initial series of 72 patients treated with this technique.

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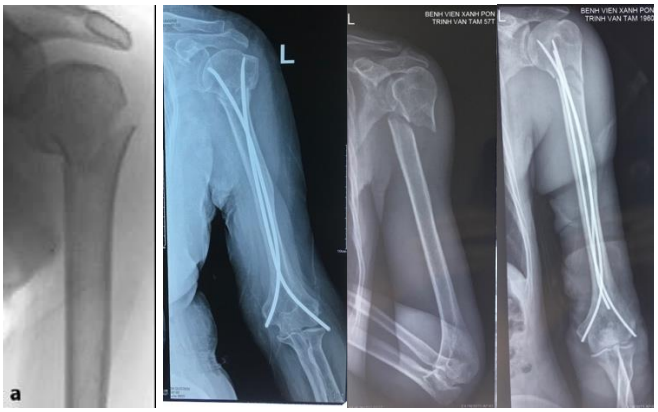
Fig. 1. CT with 3D reconstruction of the fracture.
a Initial X-ray. **b** The same case visualized in 3D reconstruction.

II. SUBJECTS AND METHODS

72 patients, 38 males and 34 females patients, average age 48,5 years (range: 6-85) with two- and three-part fractures of the proximal humerus according to the Neer Classification System were treated using intramedullary bundle fixation with 2-3 elastic titanium nails (Synthes) following the Hackethal method [12]. In most cases, the cause of fracture was a fall from a standing height. Fractures were classified according to Neer's criteria as two- and three-part fractures [13]. CT scans with 3D reconstruction (fig. 1) enabled us to classify fractures according to the classification proposed by Edelson et al. [14]. The fracture was reduced by traction and manipulation with a Schanz screw (joystick technique) and monitored using an image intensifier. In cases of two-three part frac- tures, only intramedullary titanium nails depends on the size of the marrow we used 2 or 3 TEN nails with Hackethal method for Proximal Humerus Fracture nium elastic nails (fig. 2). The nails were inserted through a win- dow on the posterior aspect of the distal humerus. The tip of each elastic nail was bent slightly to engage the humeral head in a di- vergent way. After the nails were well seated, they were bent and cut distally. The fragments of bony window were impacted to pre- vent distal migration of the implants. Usually, 3 tightly fitting elastic titanium nails having a diameter 2-3 mm, depending on the cross-section diameter of the medullary cavity, were used to assure the rotational stability of the construct. Initially, after sur- gery, the operated arm was immobilized on a sling. Starting from the second week, gradual gentle passive and assisted active mobilization was started. The progress of bone union and physiother- apy was monitored at 3-week intervals until the patient had a good range of motion of the affected shoulder, and progress of union was visible on the X-ray (fig. 3). Routinely, a postoperative CT scan with 3D reconstruction of the operated shoulder was done to better assess the position of the implants, the accuracy of reduc- tion, and the risk of secondary displacement (fig. 4). Alignment was defined as neutral, valgus or varus. The Neer score was used to assess the functional result of the treatment [15]. Patients were examined at each follow-up visit, and the final clinical score was assessed at the last follow-up. The patients were followed for 26 months.



b c d

Fig. 2. Examples of fixation of two- and three-part fractures.
a Initial X-ray of two-part fracture. **b** Postoperative X-ray of a two-part fracture. **c** Initial X-ray of a three-part fracture. **d** Post- operative X-ray of a three-part fracture.

III. RESULTS

All fractures united during an average period of 26 months. The final functional outcome overage 69,2 %.. The alignment was normal in 68 patients; 2 cases were varus and 2 cases were valgus. The alignment did not affect the clinical result or union. There were no cas- es of secondary displacement or implant migration. Three patients complained of discomfort at the entry site of the elastic nail and thus the implants were removed after consolidation; in the other patients, removal was not nec- essary. CT classification of fractures coincided with the Neer Classification System, i.e., two- and three-part frac- tures in the CT coincided with two- and three-part frac- tures in the Neer Classification System; there were 21 (29.16%) two-part fractures and and 51(70,83%) three-part fractures.

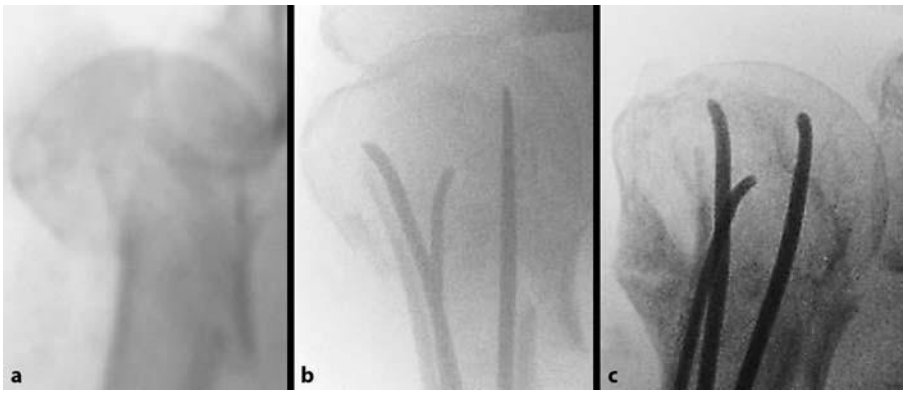


Fig. 3. Progress of the union of a proximal humeral fracture.
a Initial X-ray. **b** Postop- erative X-ray. **c** Progress of union with cal- lus formation.

IV. DISCUSSION

Fig. 4. Fixation of the fracture with CT. **a** Postoperative X-ray of two-part fracture. **b** CT in frontal plane of the same case. **c** CT in coronal plane of the same case.

The treatment of proximal humeral fractures is prob- lematic, especially in osteoporotic fractures. The inci- dence of these fractures is increasing [16, 17], and in the literature of the last 10 years, renewed interest in new fix- ation methods of two-, three-, and four-part fractures has been observed. With the higher number of osteoporotic fractures and the increasing demand for better function- al outcome, new concepts and devices for treating these difficult fractures have been designed. The initial enthu- siasm for locked plates, helix wire, proximal humeral locked nails and angled humeral blade plate has been moderated by reports on the high failure rate of some of these implants [18, 19]. Biomechanical studies revealed that weak osteoporotic bone tolerates elastic implants better than stiff implants, and within a certain range of micromotion, the fracture remains stable and bone union progresses [20]. On the other hand, stiff implants, al- though mechanically very stable, cannot deform elasti- cally during movements. They cut through the soft bone, causing loss of fixation and damage to remaining bone stock (‘mixer effect’) [21]. In our study, the initial reduc- tion was maintained throughout the treatment period in all cases and no secondary displacement was noted. We believe that the divergent position of elastic nails in the humeral head and the impaction of the bony window dis- tally provided sufficient stability to stimulate early pas- sive and assisted active range of motion without jeopar- dizing the stability of fixation and increasing the risk of implant migration. In three-part fractures, CT was help- ful in deciding upon the direction of the screws, and after surgery to confirm the reduction accuracy and position of implants in the humeral head. We did not limit the in- dication for the Hackethal technique to osteoporotic pa- tients as it was applied with excellent results to both younger and older patients. It also met the criteria of minimally invasive surgery, a current trend in modern

ortho- pedic trauma management. The success of this fixation method may depend on elastic deformation of the im- plants during the healing process, stimulating consolida- tion of well-vascularized bone fragments. Divergent im- paction of the nails that block each other in cancellous bone assures a relatively stable elastic construct. The presence of titanium, which is an osteo-inductive factor, may also play a role. In most fractures, exact anatomical reduction of fragments could not be achieved. This did not, however, affect the functional result. Improvements of minimally invasive techniques with real-time 3D frac- ture imaging and better indirect reduction tools may change this situation. Early functional treatment enabled most of our patients to have a good range of motion de- spite moderate displacement, an aspect of rehabilitation stressed in other studies [22, 23].

The major limitations of our study are the small num- ber of patients and lack of control group for compari- son.

V. CONCLUSION

The results of our study support the minimally inva- sive technique of elastic fixation of two- and three-part fractures of the proximal humerus as a viable alternative to other treatment methods.

REFERENCES

1. **Misra A, Kapur R, Maffulli N:** Complex proximal humeral fractures in adults - a sys- tematic review of management. Injury 2001; 32:363-372.
2. **Lanting B, MacDermid J, Drosdowech D, Faber KJ:** Proximal humeral fractures: a sys- tematic review of treatment. J Shoulder El- bow Surg 2008;17:42-54.
3. **Chudik SC, Weinhold P, Dahners E, Hinsdale IL, Chapel H:** Fixed-angle plate fixation in simulated fractures of the proximal hu- merus: a biomechanical study of a new de- vice. J Shoulder Elbow Surg 2003;12:578- 588.
4. **Fenichel I, Oran A, Burstein G, Perry Pritsch M:** Percutaneous pinning using threaded pins treatment option for unstable two- and three-part fractures of the proximal humer- us: a retrospective study. Int Orthop 2006; 30:153-157.
5. **Helmy N, Hintermann B:** New trends in the treatment of proximal humerus fracture. Clin Orthop Relat Res 2006;442:100-108.
6. **Gorschewsky O, Puetz A, Klakow A, Pitzl M, Neumann W:** The treatment of proximal hu- meral fractures with intramedullary titani- um helix wire by 97 patients. Arch Orthop Trauma Surg 2005;125:670-675.
7. **Khodadadyan-Klostermann C, Raschke M, Fontes R, Melcher I, Sossan A, Bagchi K, Haas N:** Treatment of complex proximal hu- meral fractures with minimally invasive fix- ation of the humeral head combined with flexible intramedullary wire fixation - in- troduction of a new treatment concept. Lan- genbecks Arch Surg 2002;387:153-160.
8. **Tamai K, Ohno W, Takemura M, Mashitori H, Hamada J, Saotome K:** Treatment of prox- imal humeral fractures with a new intra- medullary nail. J Orthop Sci 2005;10:180- 186.
9. **Martin C, Guillen M, Lopez G:** Treatment of 2- and 3-part fractures of the proximal hu- merus using external fixation. Acta Orthop 2006;77:275-278.
10. **Hall J, Phieffer L, McKee M:** Humeral shaft split fractures around proximal humeral locking plates: a report of two cases. J Orthop Trauma 2006;20:1-6.
11. **Lill H, Hepp P, Korner J, Kassi JP, Verheyden AP, Josten C, Duda GN:**

Proximal humeral fractures: how stiff should an implant be? A comparative mechanical study with new im- plants in human specimens. Arch Orthop Traum Surg 2003;123:74-81.

12. **Durbin RA, Gottesman MJ, Saunders KC:** Hackethal stacked nailing of humeral shaft fractures: experience with 30 patients. Clin Orthop 1983;179:168-174.
13. **Neer CS:** Displaced proximal humeral fractures: classification and evaluation. J Bone Joint Surg 1970;52A:1077-1089. Med Princ Pract 2009;18:284-288 287
14. **Edelson G, Kelly I, Vigder F, Reis ND:** A three-dimensional classification for fractures of the proximal humerus. J Bone Joint Surg 2004;86B:413-425.
15. **Yian EH, Ramappa AJ, Arneberg O, Gerber C:** The Constant score in normal shoulders. J Shoulder Elbow Surg 2005;14:128-133.
16. **Palvanen M, Kannus P, Niemi S, Parkkari J:** Update in the epidemiology of proximal hu- merus fractures. Clin Orthop 2006;442:87- 92.
17. **Lee SH, Dargent-Molina P, Breart G:** Risk factors for fractures of the proximal humerus: results from the EPIDOS prospective study. J Bone Mineral Res 2002;17:817-825.
18. **Meier R, Messner P, Regazzoni P, Rothfisch- er W, Gross T:** Unexpected high complica- tion rate following internal fixation of un- stable proximal humerus fractures with an angled blade plate. J Orthop Trauma 2006; 20:253-260.
19. **Khan SA:** Helix wire osteosynthesis of proximal humerus fractures: unacceptable high rate of failure. Acta Orthop Belg 2008;74: 13-16.
20. **Takeuchi R, Koshino T, Nakazawa A, Numazaki S, Sato R, Saito T:** Minimally invasive fixation for unstable two-part proximal humeral fractures: surgical techniques and clinical results using J-nails. J Orthop Trauma 2002;16:403-408.
21. **Hertel R:** Fractures of the proximal humerus in osteoporotic bone. Osteoporos Int 2005; 16:S65-S72.
22. **Hodgson S:** Proximal humerus fracture rehabilitation. Clin Orthop 2006; 442: 131- 138.
23. **Hodgson SA, Mawson SJ, Stanley D:** Rehabilitation after two-part fractures of the neck of the humerus. J Bone Joint Surg 2003; 85B:419-422.

SURVEYING THE VERTICAL SYMMETRY IN HEIGHTS OF THE CONDYLES AND THE SYMPTOMS OF TEMPOROMANDIBULAR JOINT DISORDER IN PATIENTS WITH ORTHODONTICAL TREATMENTS

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ABSTRACT

Temporomandibular disorder (TMD) includes myofascial pain and dysfunction in the joint and muscles with temporomandibular joint (TMJ), a joint connecting the mandible with the skull. The difference in the height of the protrusion is observed in the evaluation of asymmetry as a structural change that causes some risk factors for TMD. The difference in the height of the condyles was observed in the evaluation of asymmetry structural alteration that causes risk factors for TMD. The study aims to analyze the vertical symmetry in height of the condyle in association with TMD in adult patients with permannent teeth (except third molars) that undergo orthodontical treatments.

With analyzing and describing cross-sectional analysis method, we analyzed 142 patients with Angle class I, II and III malocclusion and range of ages is from 12 to 40. These patients had with variance of type I, II, and III according to Angle. In each patient, the condylar symmetry index based on Habets technique was established in relation to gender, age, and signs and symptoms of TMD as undergoing orthodontical treatment. By using Fisher's exact test, the results from investigating the relationship between TMD symptoms and the symmetry in height of the condyles have value of $p = 0.1333 > 0.05$. Therefore, there is no verification to confirm that TMD symptoms are due to the asymmetry in height of the condyles. The diagnosis of TMD using the self-answer questionnaire can help clinicians assist in developing the symmetry of the complex TMJ.

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I. INTRODUCTION

The temporomandibular joint (TMJ) is the joint connecting the jawbone to the skull, of which the right and left joints are moved simultaneously on both sides for normal functions. Often found in joints, a degree of asymmetry between the left and right joints does not necessarily cause symptoms but is considered a risk factor for developing disorders, known as temporomandibular joint disorder (TMD) [2,4,5,6]. Because facial asymmetry occurs naturally, it is not easily to determine whether the asymmetry is normal or abnormal as the determination is based on symmetry examination by clinicians and the feeling of TMJ imbalance by patients [2]. Previous studies have reported that panoramic X-rays can provide information vertical dimensions and deflection of bilateral symmetry of the joints [2,3]. The asymmetry in vertical axis of the condyles can relate to the symptoms of TMD. Indeed, there is a significant association between the TMJ asymmetry in vertical axis along with Habets index and symptoms of TMD. Saglam & Sanli [8] concluded the means of condyles height asymmetry are $6.27 \pm 8.36\%$ in healthy patients and $11.03 \pm 11.11\%$ in TMD patients based on Habets' method but did not find statistically significant differences between the two groups ($p > 0.05$).

We conducted a study of 142 patients participating in orthodontics in Khanh Hoa and selected the topic: "Surveying the vertical height symmetry of the condyles of mandible jawbone and symptoms of TMD in orthodontic patients". The aim of the study is to analyze the vertical height symmetry of the condyles with the symptoms of TMD in subjects with full permanent teeth and undergoing orthodontic.

II. MATERIALS AND METHODS

2.1. Materials: Patients' ages from12 to 40 years with full permanent teeth except for the third molars are recommended for panoramic radiographs with exposure parameters (80 kV, 15 mA, 12 seconds); performed by specialized radiologists.

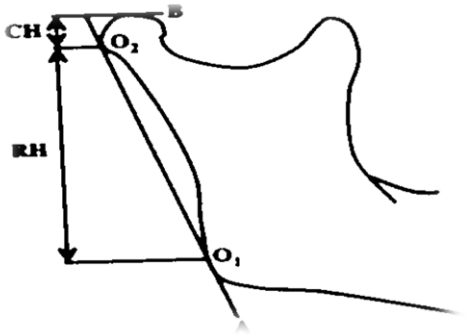

Figure 1. Landmarks for measuring the vertical asymmetry of condyles (according to Habets).

(B) the most superior point of the condyle; (O2) the most posterior point of the condyle; (O1) the most posterior point of ramus; (RH) ramal height is the distance from O1 to O2 and (CH) is condyle height

The calculation of the index is made by the following formula:

$$\text{Habets' asymmetric condyle (AI)} = \left| \frac{\text{CH (phải)} - \text{CH (trái)}}{\text{CH (phải)} + \text{CH (trái)}} \right|$$

Figure 2: *Formula to calculate condyle asymmetric index (AI) according to Habets [4]*

According to the Habets' formula, a greater than an absolute value of 6% is considered asymmetric. To determine random errors, the ratio measurements were performed by an employee and under the supervision of the author. The variables in this study were randomized from 15 panoramic X-rays. The validity and reliability according to Cohen's method [1] demonstrate the consensus for ratio measurements with $\kappa = 0.528$. Finally, the study used Habets' index as reference data to evaluate the symmetry in vertical height of the condyles.

2.2. Method*:* Analytical, descriptive study with a cross-sectional method is designed in

which we reviewed the records of all patients participating in orthodontic treatment between 2008 and 2018. Patient charts include full mouth X-rays, panoramic X-ray, biographical information about gender, age and self-assessment of TDJ. A scored TMJ self-assessment are based on the recommendation of the Academy of Research on Maxillofacial Pain, United States [4] and based on the Likert score scale [7]; in which patient will give score for each question: level 0 (never: 0 points); level 1 (rarely: 1 point), level 2 (occasionally: 2 points) and level 3 (frequently: 3 points). Total points range from 0 - 50 points.

- 0 points: normal TMD
- 1 to 10 points: mild TMD
- 11-20 points: moderate TMD
- 21-30 points: severe TMD.

The TMD self-evaluation questionnaire has been tested and verified with Cronbach's Alpha test (> 0.5).

Table 1: TMJ self-assessment as beginning of orthodontic treatment

	QUESTIONS	ANSWER			
		NONE	YES		
			1	2	3
			Rarely	Occasionally	Frequently
1	Do you have any pain or difficulty when opening your mouth or yawning?				
2	Do you ever have lockjaw or jaw luxation?				
3	Do you feel any discomfort or muscle pain when chewing, speaking or moving your jaws?				
4	Do you hear any TMJ noise?				
5	Do you often have rigidity or fatigue in jaw area?				
6	Do you have pain in the TMJ in the area temporal or cheek areas?				
7	Do you often have idiopathic headache, neck-ache or toothache?				
8	Do you have any recent injury/trauma in head, neck and jaw areas?				
9	Do you feel any recent abnormality when biting down?				
10	Do you ever have treatment in the past for idiopathic facial or TMJ pain?				

2.3 Data analysis: Software R 3.0.2 is used to analyze data.

III. RESULTS

Through analysis of 142 patients, the results are as following: the average age was 29.4 (SD 15.7), of which male accounted for 19.7% and female accounted for 80.3%, 63 patients had class I occlusion (44.4%), 48

patients had class II occlusion (33.8%) and 31 patients had class III occlusion (21.8%). Clinical symptoms related to TMD were found with the following levels: 75 patients had mild TMD (52.8%), 7 patients had moderate (4.9%), 0 patients had severe TMD (0%). There were 126 patients (88.7%) having condyles with vertical height asymmetry and 16 patients (11.3%) having condyles with vertical height symmetry.

Table 2: Relationship between symptom of TMD and vertical height symmetry of the condyles

Height of condyles	Temporomandibular joint (TMJ)		p
	Normal	TMD symptoms	
Symmetry	N = 10 (62.5%)	n= 6 (37.5%)	P = 0.1333
Asymmetry	N = 50 (39.7%)	n= 76 (60.3%)	

Fisher test is used to determine the relationship between the TMD symptoms and the vertical height symmetry of the condyles; which has the p-value of 0.1333> 0.05. This demonstrates that there is no evidence to confirm the cause of TMD is due to the asymmetry of vertical height of the condyles.

Table 3: The association between the TMD and vertical height symmetry of condyles with Angle class classifications

Angle class		Normal	TMD symptoms	p
Angle class I	Symmetry	3 (37.5%)	5 (62.5%)	P = 0.1894
	Asymmetry	35 (63.6%)	20 (36.4%)	
Angle class II	Symmetry	0	0	
	Asymmetry	15 (31.2%)	33 (68.8%)	
Angle class III	Symmetry	7 (87.5%)	1 (12.5%)	P = $8.366*10^{-6}$
	Asymmetry	0	23 (100%)	

In the groups of patients with class I and class II occlusion, there is no evidence demonstrating the association between the symptoms of TMD and the vertical height symmetry of the condyles (p=0.1894). However, in the group of patients with class III occlusion, the symptoms of TMD associated with the vertical height symmetry of the condyles ($p=8.366*10^{-6} < 0.05$).

Table 4: Scored TMJ self-assessment as beginning of orthodontic treatment

	QUESTIONS	ANSWER			
		NONE	YES		
			1	2	3
			Rarely	Occasionally	Frequently
1	Do you have any pain or difficulty when opening your mouth or yawning?	n=74	n=47	n=19	n=2
2	Do you ever have lockjaw or jaw	n=88	n=50	n=4	n=0

	QUESTIONS	ANSWER			
		NONE	YES		
			1	2	3
			Rarely	Occasionally	Frequently
	luxation?				
3	Do you feel any discomfort or muscle pain when chewing, speaking or moving your jaws?	n=79	n=53	n=10	n=0
4	Do you hear any TMJ noise?	n=91	n=49	n=2	n=0
5	Do you often have rigidity or fatigue in jaw area?	n=112	n=26	n=4	n=0
6	Do you have pain in the TMJ in the area temporal or cheek areas?	n=102	n=36	n=4	n=0
7	Do you often have idiopathic headache, neck-ache or toothache?	n=116	n=25	n=1	n=0
8	Do you have any recent injury/trauma in head, neck and jaw areas?	n=137	n=5	n=0	n=0
9	Do you feel any recent abnormality when biting down?	n=71	n=50	n=20	n=1
10	Do you ever have treatment in the past for idiopathic facial or TMJ pain?	n=125	n=12	n=4	n=1

Data analysis demonstrated the clinical symptoms of TMD as following: 75 patients had mild symptoms (52.8%), 7 patients had moderate symptoms (4.9%) and 0 patient had severe symptoms (0%).

IV. DISCUSSION

4.1 Method of measuring the condyle height to determine the symmetry vs. asymmetry in vertical axis: The TMJ is the joint connecting the mandible jaw with the skull; in which the right and left condyles are connected to the body of the mandible jaw and function simultaneously for mastication. Panoromic X-ray provide to the clinicians the whole view of both left and right TMJ comparing to other types of X-rays. Moreover, panoramic X-ray can be used to evaluate the asymmetry of the vertical height of the condyles. The greater than absolute value of 6% is considered asymmetric based on Habets method and 93% of variation according to Kjellberg [4,6]. Therefore, some authors have used the Habets index to asscess the asymmetry of the vertical heights of the condyles in patients with symptoms of TMD, posterior unilateral or bilateral cross-bite, vertical malocclusion and left and palatal clefts [2].

On the panoramic X-rays, the asymmetry indices of height of condyles are required to base on the measurements of condyle height

(CH) and ramal height (RH) according to Habets's method. Kjellberg method identified points, measurements and comparison of both sides because the measurement from the height of condyle from the most superior point of the condyle to the sigma ridge is different from the Habets method, which use the distance from the most superior point of the condyle to the most posterior point of the condyle. Veronica Iturriage et al [9] studied the measurement of asymmetric indices of vertical heights of the condyles on panoramic X-rays using both Habets and Kjellberg methods. The study concluded that both methods provided acceptable clinical measurements even with the limitation of the methods. We chose to use Habets' method in this study when obtaining the data of vertical height symmetry of the condyles because Habets method is easier to implement, easier to calculate but the accuracy is as good as that of Kjellberg's method.

4.2 The symmetry and asymmetry of the condyles in patients with orthodontic treatments: TMD includes symptoms of pain and dysfunction of muscular and TMJ joints. The variations in vertical height of the condyle were observed and determined that the asymmetry of the condyles is due to the changes in anatomically structural changes; a risk factor of TMD [4]. Our study showed that there is no evidence to confirm the association between TMD and vertical height asymmetry of the condyles according to Habets methods on panoramic X-rays in patients aged from 12 to 40 and undergoing orthodontic treatment ($p=0.133>0.05$). Compared with other studies such as Saglan and Sanli [8], the medians of condyle asymmetries were 6,27 ± 8,36% in asymptomatic TMJ patients and 11,03 ± 11,11% in symptomatic TMJ patients according to Habets method and did not find statistically significant differences between the two groups ($p>0.05$). Fuentes et al. [3] and Kjellberg et al [6] reported that the variation was probably due to the study subjects because Saglam and Sanl chose study subjects with randomly occlusion. Meanwhile, we chose the study subjects with malocclusion and undergoing orthodontic treatment.

4.3 Risk factors of TMD: Among anatomic structural changes, asymmetry in vertical height of the condyles can be a risk factor for TMD. Through investigating the association between the TMD symptoms and the vertical height asymmetry of the condyles in different Angle occlusion classification, there was no evidence demonstrating the relationship between the TMD symptoms and the vertical height asymmetry of the condyles in patients with Angle class I and class II occlusion ($p = 0.133>0.05$). Especially in patients with Angle class II occlusion, none of patients had symmetrical heights of the condyles. According to E Sofyanti et al. [2], the study in 2018 on 68 orthodontic patients, in the group of patients with TMD symptoms, the rate of patients having symmetrical heights of the condyles was 17.7% (n=12) and that of patients having asymmetrical heights of the condyles was 38.2% (n=26). In contrast, in the group of patients without TMD symptoms, the rate of patients having symmetrical heights of the condyles was 39.7% (n=27) and that of

patients having asymmetrical heights of the condyles was 4.4% (n=3). The results in the Table 3 demonstrated the p <0.05, calculated by Fisher test, in the group of patients having Angle class III occlusion. Therefore, there was an evidence to confirm that TMD symptoms are the results of asymmetrical heights of the condyles. In this group of patients, the rate of patients having asymmetrical heights of the condyles and TMD symptoms was 100%. In conclusion, the combination of having asymmetrical heights of the condyles and Angle class III occlusion is the risk factor for TMD.

4.4 Management when treating orthodontic patients having asymmetrical heights of condyles: When patients in need of having orthodontic treatments, a thorough clinical examination is the key for success. A clinician need to measure all the necessary indexes on Cephalometric and panoramic X-rays to obtain an accurate diagnosis of the symmetric of both condyles in vertical axis. This step is one of the most important steps in current protocol of orthodontic treatment. The condyles of the mandible jawbone are the anatomical structures with growth potential after puberty and can affect strongly to the occlusion during orthodontic treatments. TMD may be a direct consequence of joint inflammation and/or injury of the articular disc, affecting the development of TMJ [6,8,9]. Asymmetrical growth of both condyles is normal physiological occurrence; thus, it is not easily to determine whether the asymmetry is normal or abnormal as the determination is based on symmetry examination by clinicians and the feeling of TMJ imbalance by patients [2]. Asymmetry affects the patient's facial skeletomuscular dissonance unilaterally and could lead to developmental and functional disorders. Asymmetrical condyles probably lead to overload on TMJ and consequently affects both hard and soft tissues and increase the thickness of the tissue above the TMJ. TMD due to asymmetric height of the condyles can lead to chronic symptoms and become difficult to be treated. Therefore, the symmetry height of the condyles should be examined if patients have TMD symptoms in order to see if there is an association between asymmetry of the condyles and risk factor of TMD. This condition is associated to several factors that affect the morphology of the condyles including sexes, anatomical shapes, joint types, classes of occlusion and bone types [5]

Our study demonstrated significant differences in patients with class III occlusion having asymmetrical height of the condyles and TMD (p<0.05). Therefore, conducting orthodontic treatment early in class III occlusion patients who also have asymmetrical height of the condyles and TMD symptoms will bring a better quality of life for patients. Moreover, patients' self-assessment questionnaire can help clinician to diagnose the complicated asymmetrical height of condyles more accurately.

V. CONCLUSION

Through the investigating the association between the symmetrical vertical height of the condyle and TMD symptoms, we concluded as following:

Within 142 patients participating in orthodontic treatment, the average age of the

patients was 29.4 (SD 15.7), of which male patients were19.7% and female patients were 80.3%. There were 63 patients having class I occlusion (44.4%), 48 patients having class II occlusion (33.8%) and 31 patients having class III occlusion (21.8%). Clinical TMD symptoms are found as following: 75 patients having mild TMD, 7 patients having moderate TMD and 0 patient having severe TMD. The number of patients having asymmetrical height of the condyles was 126 (88.7%) and the number of patients having symmetrical height of the condyles was 16 (11.3%)

Data analysis of each group of patients demonstrated the association between the TMD symptoms and the vertical height symmetry of the condyles as following: there was no link between asymmetrical height of the condyle and TMD symptoms in group of patients having class I and II occlusion ($p=0.133>0.05$), meanwhile there was a relationship between the asymmetrical height of the condyle and TMD symptoms in group of patients having class III occlusion ($p<0.05$)

The symmetrical height of the condyle need to be considered and clinically examined when a patient has TMD symptoms in order to monitor the development of asymmetry and other risk factors of TMD. Patients' self-assessment questionnaire can aid clinicians to diagnose TMD relating to the complicated asymmetrical height of the condyles.

REFERENCES

1. **Cohen's kappa - Wikipedia.** https://en.wikipedia.org/wiki/Cohen%27s_kappa.
2. **E Sofyanti et al (2018).** *Comparison of condylar height symmetry and temporomandibular disorder symptom in the subject with complete teeth: a preliminary study. J. Phys.:* Conf. Ser. 1116 052065.
3. **Fuenter, R.; Engelke, W.; Bustos, L.; Oporto, G.; Borie, E.; Sandoval, P.; Garay, I.; Bizama, M. & Borquez, P. (2011).** *Reliability of two techniques for measuring condylar asymmetry with X-Rays.* Int. J. Morphol., 29(3):694-701.
4. **Habets LL, Bezuur JN, Naeiji M and Hansson TL (1988).** J Oral Rehabil. 15 465 (doi.org/10.1111/j.1365-2842.1988.tb00182.x).
5. **Kalladka M et al. (2014)** J. Indian Prosthodont Soc 14 6 (10.1007/s13191-013-0321-3).
6. **Kjellberg H, Ekestubbe A, Kiliaridis S and Thilander B (1994).** Acta Odontol Scand 52 43 (doi.org/10.3109/00016359409096375).
7. **Likert Scale:** *Definitions, Examples, and Questions | Typeform*
8. https://www.typeform.com/surveys/likert-scale-questionnaires/
9. **Saglam AA, Sanli G (2004).** *Condylar asymmetry measurements in patients with temporomandibular disorders.* J Contemp Dent Pract. 2004 Aug 15;5(3):59-65.
10. **Verónica Iturriaga; Pablo Navarro; Mario Cantin & Ramón Fuentes (2012).** *Prevalence of Vertical Condilar Asymmetry of the Temporomandibular Joint in Patients with Signs and Symptoms of Temporomandibular Disorders.* Int. J. Morphol., 30(1):315-321./.

CLINICAL AND RADIOLOGIC OF CEREBRAL VENOUS THROMBOSIS: ONE CASE REPORT

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ABSTRACT

Introduction: Cereberal venous thrombosis (CVT) is rare disease and not specifics clinical symptoms. Computer tomography (CT) and magnetic resonance imaging (MRI) remain technique choice to screening with high value.

Purpose: Presenting a rare case and review of the literature.

Case description: A 69 year olds - woman has been diagnosed an infarction transformed to heamorrhage in the left parietal cortex due to CVT by CT and MRI at Huu Nghi Hospital. Then, she was operated to relief intracranial pressure, but she did not progessing.

Conclusion: Cereberal venous thrombosis (CVT) is rare disease. Its is higher incidence in the younger women. Diagnostic is often made delay and difficult, so asking about health history and presented symptoms is most important. Radiology is necessary to determine CVT.

Keywords: *Cereberal venous thrombosis, cerebral ischemia, computer tomography, magnetic resonance imaging.*

I. INTRODUCTION

Cerebral venous system may be divided into deep and superficial vein **(Fig 1**). Superficial vein drain into superficial surface and both cerebral hemispheres, its result in sagittal sinus and cortical veins. Deep vein consist of straight sinus, transverse sinus and sigmoid sinus along with draining deeper cortical veins. Both these systems mostly drain themselves into internal jugular veins **[1-2].** Cerebral venous thrombosis (**CVT**) is one of caused in stroke, its ratio is less than cerebral artery thrombosis, however it can be caused a neurologic disorder more seriously, thus diagnosis and treatment as soon as possible. Because a plurality of clinical manifestations of this disease are varied, imaging that includes magenic resonance imaging (MRI) and computer tomography (CT) become a primary tool in the diagnosis. Literature reviewa of the world as well as in Vietnam, we found a lot of articles on this disoder, but most of them are neurologically synthesized, the signs of imaging are still less described. The purpose of this article is to show some symptoms of this disease and to review the approaching for radiologic investigation, all of them to help diagnosis as quickly as possible, we report a case of 69 year olds - woman has been diagnosed an infarction transformed to heamorrhage in the left parietal cortex due to CVT by CT and MRI at Huu Nghi Hospital. Then, she was operated to relief intracranial pressure.

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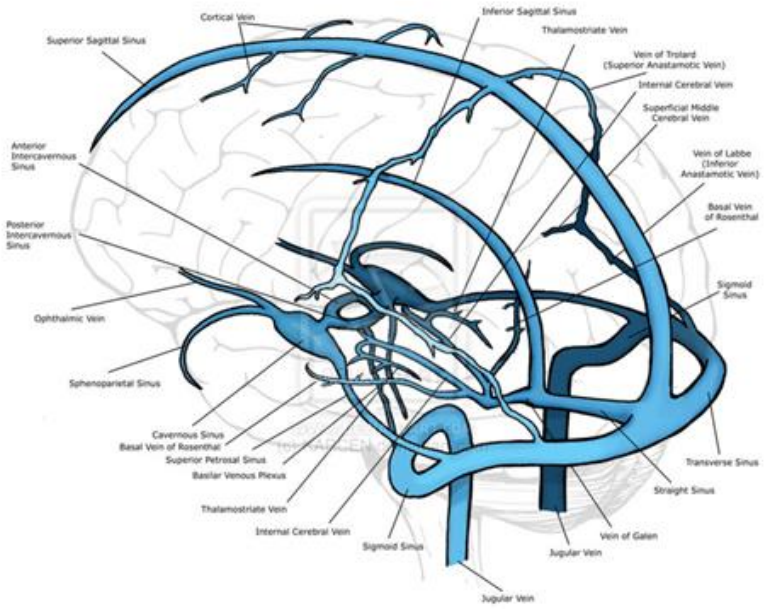
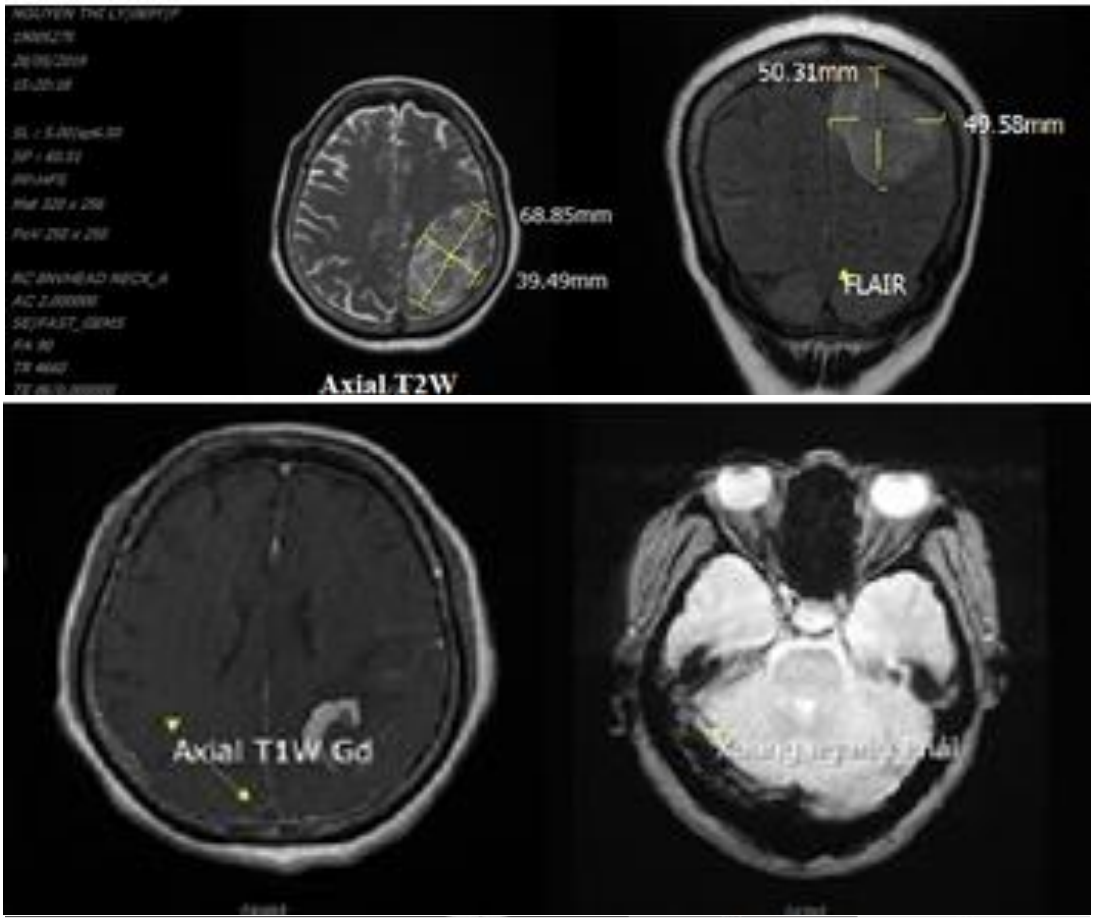


Fig.1: Cerebral venous system

II. CASE REPORT

A 69 year - olds - woman admitted to Huu Nghi hospital due to a evolutionary headache for 7 days. She had a history of high blood pressure and diabetes with a regular treatment. She had not a history of trauma. Neurological examination found a weakening of right side body and a coma with Glasgow coma scale score of 3. An emergency MRI showed a large lesion in the left parietal cortex. The lesion is measures approximately 68x39x49 mm (anterior posterior by transverse by superior-inferior), well - defined, multi - lobular, homogeneous signal. The lesion peripheral signal is low signal in T1WIs and high intensive in T2WIs and FLAIR images. The lesion central signal is high signal in T1WIs, hypointensive in T2WIs and T2*WIs, hyperintensive in FLAIR images. The lesion is no enhanced in post contrast enhancement. The lesion is surrounded by grade I perifocal brain edema (edema thickness is 7mm). The lesions and edema exert a mass effect that is effacement of the cortical sulci, right lateral midline shift at 4mm. In T2*W and T1WI gadolinium - enhancement confirm that lost of flow void in superior sagittal sinus, intrafocal cortical vein, straight sinus, right transverse sinus and empty delta sign (**Fig -2**). A MDCT 256 Slices post contrast shows a large hematoma in the left parietal cortex, normal of cerebral artery, and thrombosis in venous system that was described in MRI (**Fig - 3**). Thus imaging diagnosis is an infarction transformed hemorrhage in the left parietal cortex due to cerebral venous thrombosis. Patient neurological symptoms are worse and inside of situation is increasing of intracranial pressure. Then, patient had been operated relief the intracranial pressure, but not sign of improvement and she was death post - surgery afew day.



Figue 2: An ischemia with haemorrhagic transformed in left parietal cortex.The lesion is surrounded by grade I perifocal brain edema (edema thickness is 7mm). The lesions and edema exert a mass effect that is effacement of the cortical sulci, right lateral midline shift at 4mm. In T2*W and T1WI gadolinium - enhancement confirm that lost of flow void in superior sagittal sinus, intrafocal cortical vein, straight sinus, right transverse sinus and empty delta sign.

III. DISCUSSION

Cerebral vein system (CVS) can be separated from deep and superficial vein system, both of system mostly drain themselves into the internal jugular vein. Despite the CVS contains approximately 70% of cerebral blood volume, but stroke due to CVT is less common, about 0.5 - 1 %, from 2 to7 cases per 1.000.000 population per year **[2-3]**.

Out patient age is 62 years - old, but CVT is most common occurs in young people with approximately 50%, that is different between cerebral arteries thrombosis. Caused of CVT are varieties and distributed with age level, there are more than 100 reasons [**5-6-7**]. The reason of CVT in neonatal is systemic diseases such as shock or dehydration. Common caused in older children is local infection such as mastoditis, and hyperemia. Hyperemia is most common reasons of CVT

in adult within approximately 70% of cases. The infection is around 10% of cases. Specially, oral contraceptives increases risk of CVT within roughly 27-43 % of cases due to the ratio of female per male is 1: 0.8, other report showed the ratio of female and male is 2:1 [**6-7**]. Out patient had a history of high blood pressure and diabetes such as a risk factor for increase of hyperemia and CVT.

CVT clinical manifestations is highly variety that depends on the location, the extent level, the collateral vein and the complications. Diagnosis of CVT is more slowly and differently than CAT diagnosis, average from 7 to 10 days after onset. Common symptom are headache and focal neurological deficits (facial paralysis, hemiplegia) with approximately 75-95% of cases, however the focal neurological signs is lately present. Signs of increased intracranial pressure occur in about 20-25% of cases **[9].** Our patients had atmittted to hospital with headache during 7 days, after that she became seriously headache, coma and right - sided hemiparesis.

1.Pathophysiology and anatomic pathology:

The mechanism of cerebral venous thrombosis in particular and venous thrombosis in general explained currently by Virchow's triad: hemodynamic disruption, hypercoagulability and vessel wall injuries. These factors predispose development of venous thrombosis **[4]**.

Anatomic pathology lesions of brain parenchymal of distinct cerebral venous thrombosis compared with arterial thrombosis. Parenchyma damages are often the consequence of brain edema, which consequence of toxic, circulatory disorder and intracranial hematoma, these changes increase intracranial venous pressure. Brain edema may be caused by vascular causes, toxins or both. When collateral venous system, especially the superficial cortical veins, are insufficiently drainage. Parenchymal changes begin to occur. Pressure in blocked veins increase gradually as cerebral perfusion pressure decrease, causing cell death. However, if the venous collateral circulation are developed and the re-drainage process takes place before brain cells die and intracranial hemorrhages, the affected parenchyma will recover partially or completely **[6,7].**

The incidence of hemorrhagic infarct is higher than that of venous thrombosis compared with arterial thrombosis in about 60% of cases. Hemorrhagic is the consequence of focal or scattered vessels wall destruction caused by cytotoxic process due to ischemia. Therefore, hemorrhage pattern in venous thrombosis are usually the dotted form or the banded distribution in the cortex, the hemorrhage is often heterogeneous, especially the mass effect of milder than other forms of hemorrhage. **[8].**

Cerebral veins are subdivided into three groups: superficial veins, deep cerebral vein, and posterior fossa veins. The incidence of venous thrombosis depend on the location of vein. The most common site is superior sagittal sinus (62%), followed by transverse sinuses (45%), cortical veins, straight sinus

and jugular veins (10 -15%) **[5].** Cavernous sinus and posterior fossa venous occlusion are rare, mostly associated with some condition like facial infection, posterior fossa surgical.

2.Imaging

Venous thrombosis can be detected on non - invasive techniques images such as CT venography or MR venography. The currently popular venous imaging techniques are TOF - MR venography non - contrast and contrast enhanced, CT venography. Phase-contrast MRI less used because of dependent on technicians and algorithms. However, according to recommendation in US, NECT still be the first modality of choice in focal neurological deficit, headache and perception deterioration patient. If there is difficult to identify lesions or not observed on NECT, then other modality will be conducted **[8].**

In addition to using multiple pulse sequences to detect venous thrombosis, magnetic resonance also assesses cerebral parenchyma. TOF - MR venography is the most common technique used in the diagnosis of venous thrombosis. Compared with 3D - TOF, 2D - TOF technique is more applied due to higher sensitivity in evaluating venous system. The 2D - TOF MRA sequence is more sensitive to very slow flows with thin slices perpendicular to the venous flow in axial and coronal planes, focal acquisition, multiplanar reconstruction improve the resolution and reduce noises. Nonetheless, both 2D - TOF and 3D - TOF are the indirect images, noises still occur, contrast enhanced MRI is indicated in these situation. Phase - contrast MR venography used primarily in evaluating the direction of flow, images acquisition performed by using GRE sequences with short TE and TE, this technique less commonly used to evaluating cerebral venous system. In general, MR angiography techniques consume time and require experiences of the technicians as well as radiologist. CT venography are performed quickly with simple techniques, demonstrate the thrombosis and anatomical correlation, less artifact compared with TOF MRA sequences, in addition, development of multi-slice CT promote completion of multiplanar reconstruction techniques. Nonetheless, patient suffer from a dose of radiation when performing CT scan technique. Besides, the patient is at risk of contrast allergy. This technique is contraindicated in pregnant women and limited in young children **[8,10]**.

3.1 Non enhancement CT (NECT)

Direct signs of Cerebral Venous Thrombosis on NECT is hyperdensity venous sinus (Dense clot sign) Figure 3. It is seen about 25-30% However, it can also be seen in other causes such as: dehydration, hyper hematocrit, subdural hemorrhage, or subarachnoid hemorrhage. In these cases, Using Contrast enhacement CT or MRI That is necessary. The signs of cerebral venous thrombosis on NECT can be seen 25-30 % cases.

Signs of attenuated brain , enlargement parenchymal tissue paraventricular or in the late stage is bleeding[10].

Parenchymal lesions are characterized mainly by cortical distribution and in specific

areas according to supplying of cerebral venous sinus, It is symmetrical if sinus obstruction is above, but may be met asymmetrical if obstruction is in Gallen or Labbé vein.

3.2 Contrast enhancement CT (CECT)

Direct visualizations of cerebral venous thrombosis on CETC is " Empty delta sign" Figure 3. It's seen about 29-30% of case with thrombosis sagital venous sinus, usually apprears from 5 days to 2 moths after onseting . However, it may be confusion in the case of subdural hemorrhage On Contrast enhacement CT, collateral status will be evaluated, but on TOF-MRI, it will be more difficult to make that. The progessive of the technique CT with thin slice and recontruction on multiple plantar gives many advantages of multi-slices CT for diagnosis cerebral thrombosis venous sinus. It is very useful for interventionist [8]. Other words, Contrast enhacement CT permits to distingwish with arterial infaction in some difficult cases.

3.3. Magnetic resonance imaging findings:

Conventional MRI and TOF -MRI permit to assess cerebral venous thrombosis and focal parenchymal change. Thrombus on conventional MRI is seen as loss of high flow signal from the sinus. It's seen about 10-30% of cases. However, in cases with heart failure causing slow flow blood, this sign may be easily confusion with venous thrombosis. So it is necessary to notice in the setting and contrast enhancement CT method.

MRI permits to evaluate the collateral venous status by pulse sequences 2D - TOF or Contrast enhanced MRI. But collateral venous status is usually small on multi-slice CT, so MRI is more effective than MSCT for accessing collateral venous status.

Changing parenchymal brain is a direct sign and observed on MRI more easily and earlier than on CT. Ischemic brain injury occur in about 75% of cases. Characteristic brain injury area depends on local obstruction. Cerebral venous thrombosis's most commonly seen cortex and symmetrical obstruction at superior/ inferior venous sinus, however, obstruction of other sinus's seen only one side.

The pathology of haemorrhage in the infarction area is more commonly seen in venous infarction than arterial infarction with about 60% of cases coming late. The stage of infarction and infarction hemorrhaging transformation area can be determined by some pulse sequences on MRI (T1W, T2W, T2 * W, FLAIR) [8,9,10] - Fig 2.

However, in some cases the patient is elderly and unable to stay still during the scanning, the choice of MRI to assess cerebral venous thrombosis is often difficult and may fail, or in some cases, the patient has nyctophobia, take MRI can not perform

Valuation of MR venography weight in CVT:

The advantages and disadvantages of MR venography techniques are summarized at table 1 by Colin S.P (2007) **[10]**.

Table 1 **[10]**:

Technique	Advantage	Disadvantage
Time - of - flight	Short imaging time	More prone to false-positive results from in-plane flow
		False-negatives due to methemoglobin
Phase contrast	Better background suppression	More sensitive to motion artifacts and turbulent flow
	Can detect flow in all three orthogonal planes	
	Better flow quantification	
	No False-negatives due to methemoglobin	
Gadolinium - enhanced	Less likely to give false-positives due to slow or complex flow	Potential false-negatives due to methemoglobina or enhancing chronic thrombosis

3.4 Comparision of CT venography and MR venography in CVT:

This comparision is not only CVT but also with cerebral arterial thrombosis. Up to now, there are not yet consummation, such as not big data to demonstrated.

Colin S.P (2007) reviewed the literature for strong and weakness points of CT and MR venography and summarized in Table 2 **[10]**.

Table 2 **[10].**

Technique	Advantage	Disadvantage
MR Venography	No radiation risk	Connot be used in patients with contradication to MRI
	Set up the multiplanar reconstruction	Artifact of TOF weight
	Early and easily detect brain parenchyma	
CT Venography	Short imaging time	Accept a radiation dose
	Decrease to motion infaction	Allegy to contrast agent
	Generally better availability	Limitation on pregnant and children
	Easily to perform in critical patients	
	Better detection small vessels	
	Easily to interpret	

IV. CONCLUSION:

CVT is rare, higher incidence in young women, necessary to find out the clinical and history of patient. Imanging is a high valuation and such as the primary technique to diagnosis. CT venography or MR Venography can be detected for CVT. Radilogic findings are thrombosis in cerebral venous, collateral vein, brain ischemia, hemorrhagic transformation.

REFERENCES:

1. **Ryan S.P., Mc Nicholas M.M.J.,** Central Nervous system in Anatomy for diagnostic Imaging by W.B. Saunders Company Ltd. London. 1998, pp 77-80.
2. **Kido DK, Baker RA, Rumbaugh Calvin L**. Normal Cerebral Vascular Anatomy. In: Abrams Angiography, Vascular and Interventional Radiology by Abrams HL, Third Edition. Little, Brown and Company, Boston. USA. 1983 pp 257-68.
3. **Stam J.** Cerebral venous and sinus thrombosis incidence and causes in ischemic stroke. Adv Neurol 2003;92:225-232.
4. **DeWalt DA, Pincus T**. The legacies of Rudolf Virchow: cellular medicine in the 20th century and social medicine in the 21st century. Isr Med Assoc J 2003;5:395-397.
5. **Ferro JM, Canhão P, Stam J et-al**. Prognosis of cerebral vein and dural sinus thrombosis: results of the International Study on Cerebral Vein and Dural Sinus Thrombosis (ISCVT). Stroke. 2004;35 (3): 664 - 70.
6. **Ameri A, Bousser MG.** Cerebral venous thrombosis. *Neurol Clin* 1992; 10:87-111.
7. **Van Gijn J.** Cerebral venous thrombosis: pathogenesis, presentation and prognosis. *J R Soc Med* 2000; 93:230-233.
8. **James L.L et al**. Imaging of Cerebral Venous Thrombosis: Current Techniques, Spectrum of Findings, and Diagnostic Pitfalls. RadioGraphics 2006; 26:S19-S43
9. **Masuhr F, Mehraein S, Einhaupl K**. Cerebral venous and sinus thrombosis. J Neurol 2004;251:11-23.
10. **Colin S. Poon et al**. Radiologic diagnosis of cerebral venous thrombosis: pictorial review. American Jounal of Roentgenology. 2007;189: S64-S75. 10.2214/AJR.07.7015

RÉSUMÉ:

CLINIQUE ET RADIOLOGIQUE DES THROMBOSE VEINEUSE CÉRÉBRALE: UN RAPPORT DE CAS

Introduction: La thrombose veineuse cérébrale (TVC) quelle est une maladie rare et non des symptômes cliniques spécifiques. La tomodensitométrie (CT) et l'imagerie par résonance magnétique (IRM) restent le choix de la technique de dépistage de grande valeur.

L'objectif: la Présentation d'un cas rare et d'une révision de la littérature.

Description de cas: Une femme de 69 ans - a été diagnostiquée un infarctus transformé en hémorragie dans le cortex pariétal gauche dû au TVC par CT et IRM à l'hôpital de Huu Nghi. Puis, elle a été opérée pour soulager la pression intracrânienne, mais elle n'a pas progessing.

Conclusion: La thrombose veineuse cérébrale est une maladie rare. Son incidence est plus élevée chez les jeunes femmes. Le diagnostic est souvent long et difficile, il est donc primordial de connaître les antécédents médicaux et les symptômes présentés. La radiologie est nécessaire pour déterminer la TVC.

Mots-clés*: thrombose veineuse de cérère, ischémie cérébrale, tomographie par ordinateur, imagerie par résonance magnétique.*

ASSESSMENT RELATED BETWEEN HELICOBACTER PYLORI INFECTION AND CHRONIC GASTRITIS IN VIETNAMESE ETHNIC MINORITY PEOPLE

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ABSTRACT

ASSESSMENT RELATIVED BETWEEN HELICOBACTER PYLORI INFECTION AND CHRONIC GASTRITIS IN MINORITY ETHNIC GROUPS INVIETNAM

Objectives: To determine the prevalence of *Helicobacter pylori (H. pylori)* infection and chronic gastritis among ethnic minorities in Vietnam.

Methods: The study was conducted on 328 chronic gastritis patients of ethnic minorities in Lao Cai and Dac Lac provinces, aged from 18 and above. *H.pylori* infection rate was diagnosed by 5 different methods: rapid urease test, bacterial culture, histopathology including immunohistochemistry and serology. Assessing gastric lesions by gastroscopy and histological

Results: The prevalence of H. pylori in chronic gastritis patients in Dak Lak ethnic minority is 77.7%, statistically significant higher than Lao Cai (41.4%) with p <0.001.

H. pylori rate in women is 52.5%, higher than the rate of H.pylori infection in men (44.2%) respectively but it is not statistically significant with (p> 0.05).

In general. The prevalence of gastric damage was diagnosed by endoscopy in people with H. pylori (+) is much higher than people with H.pylori (-), with (p <0.05). The highest proportion of H.pylori possitive is atrophic gastritis in (68.4%) comparing with H.pylori negative is 31.6% respectively (statistically significant with (p< 0.01).

Conclusion: *H.pylori* infection rate among ethnic minorities in Vietnam is quite high; There is difference in the prevalence of *H.pylori* infection between Lao Cai and Dac Lac provinces and between men and women. The rate of gastric lesions by endoscopic diagnosis in *H.pylori*-positive people is much higher than that of *H.pylori*-negative people. The majority of gastritis atrophy in people *H.pylori* possitive.

Keywords*: Helicobacter pylori; chronic gastritis, gastric pathology, Lao Cai, Dac Lac.*

I. INTRODUCTION

Helicobacter pylori infection (H. pylori) has now been confirmed as a major cause of chronic gastritis and gastroduodenal ulcer [1]. Vietnam is located in Southeast Asia, including 54 ethnic groups. Including, Kinh people are majority with 87% in the Vietnamese community. Other ethnic groups (53 ethnic groups), most of them are living in

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the highlands, mountains from the North to the Southe of Viet Nam. In recent years, there have been many studies that have clarified many characteristics of H.pylori infection in both frequency and risk factors of increased infection, however, most of the studies have focused on the Kinh ethnic group, only a few initial studies on the epidemiology of H. pylori infection on children of among ethnic minority in northern region [3]. The research of Le Quang Tam on ethnic minorities in Dak Lak has only initially study on the frequency of H.pylori infection and the relation to environmental factors... [2]. Therefore, the determination of H. pylori infection rate and factors related to the increase in infection among ethnic minorities is necessary for proposing disease prevention measures. In this study, we want to research about the frequency infection, virulence factors and analysis of the toxic factors of H. pylori with gastroduodenal pathology among ethnic minorities in 2 provinces: Lao Cai (North).) and Dak Lak (Central), Vietnam.

II. SUBJECTS AND METHODS OF THE STUDY

1. Research subjects:

We selected 328 chronic gastritis patients from ethnic minorities who agreed to participate in the study, Lao Cai province had 198 patients and Dak Lak province had 130 patients aged frome 18 and above, regardless of gender or occupation.

2. Time and place of research.

The study was conducted from March 2013 to June 2014 in 7 districts of Lao Cai province: Bat Sat, Muong Khuong, Sapa, Van Ban, Simacai, Bac Ha and 2 districts in Dak Lak province including: Eaka and Buon Ho.

3. Sample size and sample selection.

In Lao Cai province, we collected 198 from 335 participans were eligible for study. In Dak Lak province, from 335 patients participating in the examination, we selected 198 patients were eligible for the study.

4. Research Methodology

4.1. Methods: Descriptive study, cross-sectional study design.

4.2. Research sequence: All patients eligible for study were clinically examined (functional symptoms and physical symptoms), complete subclinical tests, medical history, gastric endoscopy and biopsy. These parameters are updated in the study report.

* Gastroscopy:

- Assessment of chronic gastritis based on updated Sydney system.

- Get all 08 biopsy pieces in the gastric. 01 piece in body or entrum for urease test, 01 piece in body or entrum for H.pylori culture, 02 pieces for histopathology, 02 pieces for immunohistochemistry, 01 piece for identifies host factors.

* Serum sampling: All chronic gastritis patients were taken 5ml of blood, then conducted serum separation (centrifugation 3000 rpm / min) to test to identify anti - H. pylori IgG. Store serum at -80oC.

* Diagnosis H.pylori infection

In order to increase the accuracy of H. pylori infection diagnosis, we conducted 5 tests using 4 different methods that were performed, including: rapid urease test, bacterial culture, histopathology and quanitative of HP antibody testing. H.pylori infection is comfirmed when culture result is positive. Incase of cultures are negative, H.pylori infection is confirmed when at least 2 of the 4 tests must be positive results such as histopathological test, immunohistochemistry test, anti-H. antibody test. pylori and CLO test. H.pylori infection was not confirmed when all 5 tests were negative, or only 1 of the 4 tests showed positive results.

* Gastroduodenal pathology:

Assessing gastric and duodenal lesions through endoscopic diagnosis and histopathology: Endoscopic lesions assess mucosal observations in endoscopy, evaluation criteria based on update Sydney classification, lesion assessment Histopathological lesions classify cancer risk according to OLGA.

* Statistical analysis

The data is encrypted, made on computers by SPSS 22.0 software. The $\chi 2$ test evaluates the ratio difference of a parameter. Analyze variance to compare mean values when the number of samples is greater than 2. Odds ratio to assess the difference between the two study groups. The testing results are evaluated to be statistically significant when $p < 0.05$.

III. RESULTS

3.1. The prevalence of H. pylori among people in Lao Cai and Dak Lak provinces

Table 3.1. H.pylori detection rate by ethnic minority groups

Place / Ethnic groups	*H.pylori* (+)	*H.pylori* (-)	Total (n, %)
Bố Y (n, %)	0	1 (100)	1 (0,3)
Dao (n, %)	10 (24,4)	31 (75,6)	41 (12,5)
Dáy (n, %)	1 (33,3)	2 (66,7)	3 (0,9)
Ê Đê (n, %)	94 (78,3)	26 21,7)	120 (36,6)
Mông (n, %)	38 (55,9)	30 (41,1)	68 (20,7)
Mán (n, %)	1 (100)	0	1 (0,3)
Nùng (n, %)	7 (43,8)	9 (56,3)	16 (4,9)
Ráy (n, %)	2 (50,0)	2 (50,0)	4 (1,2)
Tày (n, %)	15 (30,6)	34 (69,4)	49 (14,9)
Thái (n, %)	1 (100)	0	1 (0,3)
Vân Kiều (n, %)	1 (100)	0	1 (0,3)
Xá phó (n, %)	13 (56,5)	10 (43,5)	23 (7,0)
Tổng (n, %)	183 (55,8)	145 (44,2)	328 (100)

Comment: The prevalence of H. pylori among Ede people is the highest (78.3%), followed by the ethnic groups: Xa Pho (56.5%) and Mong (55.9%) respectively. The prevalence of H. pylori is lowest among Dao people (24.4%).

3.2. H.pylori infection rate among ethnic people

Table 3.2 H.pylori detection rate by provincial

Provincial / Diagnosis	Lào Cai (n, %)	Đắc Lắc (n, %)	*p*	Total (n, %)
H.pylori (+)	82 (41,4)	101 (77,7)	<0,001	183 (55,8)
H.pylori (-)	116 (58,6)	29 (22,3)		145 (44,2)
Tổng (n, %)	198 (60,4)	130 (39,6)		328 (100,0)

Comment: The prevalence of H. pylori in chronic gastritis patients in Dak Lak ethnic minority is 77.7%, significantly higher than that in Lao Cai (41.4%) with p <0.001.

Table 3.3. H.pylori detection rate by gender

Gender / HP diagnosis	Male (n, %)	Female (n, %)	*p*	Total (n, %)
H.pylori (+)	87 (60,0)	96 (52,5)	>0,05	183 (55,8)
H.pylori (-)	58 (40,0)	87 (47,5)		145 (44,2)
Total (n, %)	145 (44,2)	183 (55,8)		328 (100,0)

Comment:The prevalence of H. pylori in women is 52.5%, higher than the rate of H.pylori infection in men (44.2%) but it is not statistically significant (p> 0.05).

Table 3.4. H.pylori detection rate by age groups

Ages / Diagnosis	< 30 (n, %)	30-39 (n, %)	40-49 (n, %)	50-59 (n, %)	60-69 (n, %)	≥ 70 (n, %)	Total (n, %)
H.pylori (+)	37 (46,3)	62 (59,6)	36 (54,5)	32 (66,7)	12 (50,0)	4 (66,7)	183 (55,8)
H.pylori (-)	43 (53,8)	42 (40,4)	30 (45,5)	16 (33,3)	12 (50,0)	2 (33,3)	145 (44,2)
Total (n, %)	80 (24,4)	104 (31,7)	66 (20,1)	48 (14,6)	24 (7,3)	6 (1,8)	328 (100,0)

Comment: The prevalence of H. pylori is highest in the age group ≥ 70 (66.7%) and the age group 50-59 (66.7%), followed by the age group 30-39 (59.6%).

The prevalence of H. pylori is lowest in the age group <30 (46.3%) and then in the age group of 60-69 (50.0%).

Table 3.5. Relationship between H. pylori infection and gastroscopy lesions

Endoscopy diagnosis / HP diagnosis	Erythematous gastritis	Raised erosion	Atrophy	Flat erosion	Rugal hyperplasia	Difference
H.pylori (+)	73 (53,7)	33 (58,9)	143 (68,4)	69 (51,5)	4 (36,4)	4 (57,1)
H.pylori (-)	63 (46,3)	23 (41,1)	66 (31,6)	65 (48,5)	7 (63,6)	3 (42,9)

Comment: In general, the rate of gastric lesions by endoscopic diagnosis in people with H. pylori (+) is much higher than that of people with H.pylori (-) with ($p < 0.05$) and the highest is lesions form of atrophic inflammation (68.4%).

Table 3.6. The degree of atrophic inflammation (on OLGA scale) divided by age group in ethnic VDDM patients

.	Age group of chronic gastritis patients in ethnic groups						Total
	< 30	30-39	40-49	50-59	60-69	≥ 70	
Grade 0 (No atrophy)	44 (55,0)	46 (44,2)	35 (53,0)	15 (31,3)	15 (62,5)	5 (83,3)	160 (48,8)
Grade 1 (Slight atrophy)	33 (41,3)	49 (47,1)	25 (37,9)	26 (54,2)	5 (20,8)	1 (16,7)	139 (42,4)
Grade 2 Mid atrophy)	3 (3,8)	8 (7,7)	3 (4,5)	7 (14,6)	4 (16,7)	0 (0,0)	25 (7,6)
Grade 3 (Severe atrophy)	0 (0,0)	1 (1,0)	3 (4,5)	0 (0,0)	0 (0,0)	0 (0,0)	4 (1,2)
Total	80	104	66	48	24	6	328

Comment: In the age group <60, the rate of atrophic gastritis at the grade from 0 to 3 (score 0 to score 3) varies not statistically significant. The rate of atrophic gastritis at grade 2 (score 2: moderate atrophy) in people ≥ 50 years old (31.3%) increased more than the rate of atrophic gastritis grade 2 in people <50 years old (16.0%).

IV. DISCUSSIONS

4.1. H.pylori infection rate among minority people

Studies on H.pylori in Vietnamese are mostly concentrated in Kinh people, living in urban areas or plains. Studies have shown that the incidence of H. pylori infection is high in community testing and in gastric conditions. Study by Nguyen Lam Tung et al (2010), in collaboration with Oita University, studies on Kinh people in 2 major cities: Ho Chi Minh and Hanoi, showing the prevalence

of H. pylori in pathologies The stomach accounts for 65.6% [4]. Thus, the prevalence of H. pylori in gastric diseases in Kinh people is quite high.

However, research on H. pylori among ethnic minorities is still quite small and only on through epidemiological surveys on children (<16 years) [3]. In our study (Table 3.1), H. pylori infection in ethnic minorities accounts for a high proportion: 77.7%.

The prevalence of H. pylori is highest in the age group ≥ 70 (66.7%) and the age group 50-59 (66.7%), followed by the age group 30-39 (59.6%).

The prevalence of H. pylori is lowest in the age group <30 (46.3%) and then in the age group of 60-69 (50.0%). H.pylori infection rates in the two provinces are difference, prevelence of H.pylori infection in Dac Lak is higher than Lao Cai, while the infection rates in men are different from the infection rates in women but not statistically significant with p>0/05. The results of Table 3.2 indicate that: H.pylori infection rate in Dak Lak province (77.7%) is higher than that of H.pylori infection in Lao Cai province (42.3%). The prevalence of H. pylori in women is 52.5%, higher than the rate of H.pylori infection in men (44.2%) but it is not statistically significant (p> 0.05). A number of studies in countries in the Asia Pacific region show that environmental conditions, customs, living habits and economic conditions affect the frequency of H. pylori infection [6], [7]]. In fact, the living conditions of the ethnic minorities in the two provinces of Lao Cai and Dak Lak are not similar, so this may be the reason that the H.pylori infection rate are difference between the two provinces.

4.2. Stomach damage and its association with H. pylori infection in ethnic minorities

Based on the results of the colonoscopy and diagnostic tests for H.pylori infection, we have categorized the different types of lesions in those who volunteered in this study. Results in Table 3.5 indicate that: The proportion of gastric lesions in H.pylori infected patients is quite high (from 38.8% to 68.4%), in which the rate of atrophic gastritis is the highest. (68.4%), followed by raised erosion gastritis (58.9%). Meanwhile, the rate of gastric lesions in patients without H. pylori infection was lower (from 41.1% to 63.6 %) with the difference between the 2 groups p <0.05. Thus, there is a strong association between H. pylori infection and gastric lesions. Le Quang Tam's research in Ede adults (Dak Lak) shows that the prevalence of H. pylori (60.4%) is lower than our study in patients with stomach ulcers [2].

Analysis of atrophic inflammation at OLGA scale (Table 3.6) by age group shows that the

In the age group <60, the rate of atrophic gastritis at the grade from 0 to 3 (score 0 to score 3) varies not statistically significant. The rate of atrophic gastritis at grade 2 (score 2: moderate atrophy) in people ≥ 50 years old (31.3%) increased more than the rate of atrophic gastritis grade 2 in people <50 years old (16.0%).

majority of chronic gastritis people atrophy at 0 or 1 level (accounting for 91.2%). Rate of atrophic gastritis by age group: in groups under 60 years of age with atrophic gastritis grade 1 is higher than the

age group above 60; the age group from 40 to 60 has a higher rate of atrophic gastritis at the age group of 40 and over 70. Studies around the world have shown: genetic factors of H. pylori, host and environment factors are closely related to grade of stomach - duodenum lesions [5] [6], [7].

V. CONCLUSION

H.pylori infection rate among ethnic minorities in Vietnam is quite high; There was difference in H.pylori infection rate between Lao Cai and Dak Lak provinces as well as between men and women (p> 0.05).

The rate of gastric lesions is assessed by endoscopic and histological diagnosis in H.pylori-positive people is much higher than that of H.pylori-negative people. The majority of atropic gastritis is in H.pylori infection people.

REFERENCES

1. **Ando T., Goto Y., Maeda O. et al. (2006),** "Causal role of Helicobacter pylori infection in gastric cancer", *World Journal Gastroenterol*, 14 (12(2)), pp. 181-6.
2. **Lê Quang Tâm (2011),** *Viêm loét dạ dày tá tràng và nhiễm Helicobacter pylori trên bệnh nhân tại Bệnh viện Đắc Lắc,* Luận văn thạc sĩ y học, Đại học Y Dược TPHCM.
3. **Mai Hồng Bàng (2006)**, "Đặc điểm lâm sàng, hình ảnh nội soi và mô bệnh học của ung thư dạ dày", *Tạp chí Y học thực hành*, (3), Tr. 87-89.
4. **Nguyen L.T., Uchida T., Tsukamoto Y. et al (2010)**, "Clinical relevance of cagPAI intactness in Helicobacter pylori isolates from Vietnam", *Eur J Clin Microbiol Infect Dis*, 29 (6) 651-660.
5. **Qabandi A. A., Mustafa A. S., Siddique I. et al (2005)**, "Distribution of vacA and cagA genotypes of Helicobacter pylori in Kuwait", *Acta Tropica*, 93 pp. 283-8.
6. **Uemura N., Okamoto S., Yamamoto S. (2002)**, "H. pylori infection and the development of gastric cancer", *Keio J Med*, 51 Suppl 2 63-68.
7. **Yamaoka Y. (2010)**, "Mechanisms of disease: Helicobacter pylori virulence factors", *Nat Rev Gastroenterol Hepatol*, 7 (11) 629-641.

ITRACONAZOLE IN THE TREATMENT VIETNAMESE PATIENT WITH TINEA CORPORIS

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ABTRACT

Objectives: To evaluate the efficacy of itraconazole in the treatment patient with tinea corporis. ***Population and methods:*** Clinical trial on one hundred-sixteen patients with tinea corporis who was positive with culture, were received itraconazole 200mg a day for 7 days. The results were assessed after 4 weeks based on the improvement of the total clinical symptom score and direct fungal examination. ***Results***: After 4 weeks of treatment, the percentage of clinical symptoms of scaling, erytherma and itching were 82.8%, 68.1% and 23.3%, respectively. The cure rate for fungus was 88.8%. The clinical and laboratory cure rate was 77.6%, improve 22.4%. The rate of recovery by lesion area was less than 5% higher than over 5%, *T. tonsurans* was higher than the other species. Adverse effects were uncommon, mainly nausea (6.9%). ***Conclusion***: Itraconazole was efficacy and safety in the treatment patient with tinea corporis.

Key words: *Tinea corporis, itraconazole, T. tonsurans*

I. ITRODUCTION

Tinea corporis was a common dermatophytes disease, caused by *Trichophyton*, *Microsporum* and *Epidermophyton*. According to Gino A. Vena, in Italy, for 6 years (2005-2010), out of 6133 patients, the incidence of the disease was about 22.7%, ranking the second among superficial fungal disease [1]. Typical clinical manifestations are arc lesions, lesions at the edge of lesions, central tendency to heal on body, hands and feet, except palms, soles and groin. It was not difficult to treat the disease, but it often relapse if the treatment was not right and enough doses. Topical drugs makes it difficult for patients to comply with treatment because of long-term treatment, time and high cost. On the other hand, *T. tonsurans* has been considered to be one of the main causes of disease besides *T. rubrum*, which was less responsive to terbinafin [2], [3]. Itraconazole was an azole antifungal drug that was highly effective in treating superficial fungal disease in dermatophytes infections and tinea corporis in particular. According to R. Hay (2018), itraconazole with 200-400mg daily for 1-2 weeks was suitable for the treatment of tinea corporis [4]. However, in Vietnam, there was no research on itraconazole short-term regimen. Therefore, we conducted research with the aim of evaluating the results of treating tinea corporis by taking itraconazole with 200mg daily for 7 days.

II. PATIENTS AND METHODS

1. Patients

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From July 2018 to June 2019, we carried out on 116 patient with tinea corporis who were both sexes, aged 16 to 70 years.

Patients were excluded from the study with the following characteristics: pregnant and breastfeeding women; HIV infection, other immunodeficiency disease; liver and kidney disease; other skin disease such as inflammation, ulcer, other skin infections; taken antifungal drugs, systemic or topical corticosteroids within the previous 1 month and a history of allergy to itraconazole.

2. Method

2.1. Design and sample size

- Comparative clinical trial study before and after treatment

- The sample size was calculated according to the formula describing a percentage of the World Health Organization, in which the cure rate when treated with itraconazole according to Boonk W. et al [5] was p = 0.6. The result of calculating the sample size n = 114, this study we choose the sample size n = 116 patients.

2.2. Steps to conduct research

The patient has a clinical examination and conduct direct examination. All patients were assessed for clinical symptoms arcording to Priyanka Sharma (2019) [6] for symptoms of pruritus, erytherma, and scale: score of 0 (asymptomatic), score of 1 (mild), point 2 (moderate), point 3 (severe). Afterwards, record the total score of clinical symptoms to evaluate the disease level as follows: score 0-3 (mild), score 4-6 (moderate), score 7-9 (severe).

Patients who had positive direct examination were cultured. Patients who were confirmed fungus species were treated with itraconazole 200 mg daily for 7 days.

After 4 weeks of treatment, the patient was examined, assessed clinical symptoms and direct examination. Evaluation of clinical improvement according to Priyanka Sharma (2019) [6]. The treatment result are based on the improvement of clinical symptoms and direct examination.

Patients also noted adverse effects: nausea, headache, erythema, urticaria.

2.3. Data processing methods

Data collected were processed using SPSS 16.0 software, p value <0.05 was considered as a statistically significant difference.

III. RESULT AND CONCLUSION

From July 2018 to June 2019, we selected 116 patients who were confirmed fungus species. The average age was 34.1 ± 15.0, the highest age was 70 years old, the lowest was 15 years old. Male was mainly sex with 77.6%, females only 22.4%.

Table 3.1. Clinical symptoms and direct examination at the baseline and after 4 weeks

Characteristic		Baseline		After 4 weeks		p
		n	%	n	%	
Scale	Yes	110	94.8	20	17.2	<0,05
	No	6	5.2	96	82.8	
Erytherma	Yes	113	97.4	37	31.9	<0,05
	No	3	2.6	79	68.1	
Pruritus	Yes	113	97.4	89	76.7	<0,05
	No	3	2.6	27	23.3	

Characteristic		Baseline		After 4 weeks		p
		n	%	n	%	
Involved skin area	<1%	30	25.9	103	88.8	<0,05
	2-5%	69	59.5	7	6.0	
	>5%	17	14.7	6	5.2	
Direct examination	Positive	116	100	13	11.2	<0,05
	Negative	0	0	103	88.8	
Total		116	100	116	100	--

At baseline, 94.8% of the patients had scale, 97.4% had itching and 97.4% had erytherma, after the treatment, this percentage decreased to 17.2%, 31.9% and 76.7 %, respective, the difference was statistically significant with p <0.05. This result was similar to the study of Kumar Amit (2013) [7]. After treatment, the total symptom score of terbinafin group was from 6.43 ± 1.50 to 0.79 ± 1.76; of the fluconazole group from 6.42 ± 1.55 to 1.28 ± 2.29, the difference was statistically significant with p <0.05. In our study, scales was most evident. In our opinion, scales are a common symptom of a fungal infection, caused by dermatophytes. Meanwhile, pruritus are subjective of the patient, so the change was at least 4 weeks after treatment.

According to the authors, the cure rate for fungi was the most important in assessing the effectiveness of the treatment. After treatment, the positive test rate decreased from 100% to only 11.2%. Thus, the cure rate for fungus was 88.8%. There was result was higher than the result of Boonk W. [5]. The cure rate for fungi when itraconazole treatment dose of 100mg daily for 2 weeks and 200mg daily for 1 week was 70% and 60%, respectively. Another study of A. Bhatia (2019) in the treatment of tinea fungus also showed that itraconazole was effective with a fungal cure rate of 91.8% compared to terbinafin of 74.3% [8]. However, in this study, the author used a prolonged dose, itraconazole 200mg daily and terbinafin 500mg daily for 4 weeks. In Vietnam, Nguyen Thai Dung when treating fungal skin disease with oral terbinafin combined with topical also gave a cure rate of 85.2% [9]. As such, our research results are consistent with authors around the world and Vietnam.

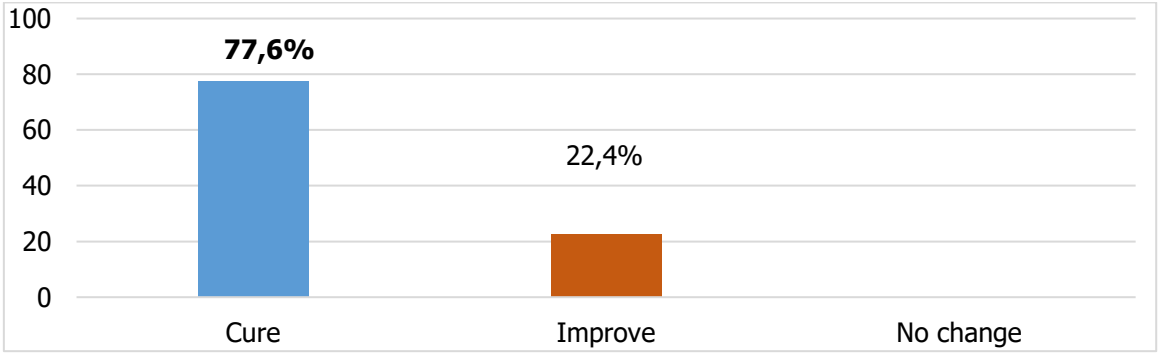

Figure 3.1. The result of treament after 4 weeks

After 4 weeks of treatment, the cure rate was 77.6%, the improve rate was 22.4%, there was no patient who did not change before and after the treatment. According to Kumar Amit (2013) in a clinical trial comparing the effectiveness of treatment with terbinafin and fluconazole in 116 patients divided into 2 groups, the author found that the complete cure rate of terbinafin group was 92.86 %, of fluconazole group was 82% [7]. Our results treated with itraconazole were higher than the fluconazole group and lower than the terbinafin group. However, in this study, the author used terbinafin regimen 250mg daily for 4 weeks and fluconazole 150mg once a week for 4 weeks. When compared with terbinafin, A. Bhatia (2019) showed that itraconazole was more effective with a complete recovery rate of 46% compared to 37%.[8]. According to Nguyen Thai Dung et al, combining oral and topical terbinafin for 4 weeks, the complete cure was 51.9% [9]. The rate of improve in our study was higher than that of the authors. We believe that the author's research on all fungal skin patients in general, and we only evaluate on culture. Overall, itraconazole was effective in the treatment of mycosis.

Table 3.2. The relationship of treatment result with clinical and subclinical characteristis

Characteristic		**Cure**		**Improve**		**p**
		n	**%**	**n**	**%**	
Involved	≤5%	78	78.8	21	21.2	<0.001
	>5%	12	70.6	5	29.4	
Digree of disease	Mild	4	100	0	0	>0.05
	Moderate	45	75.0	15	25.0	
	Servere	41	78.8	11	21.2	
Species	*T. tonsurans*	41	77.4	12	22.6	<0.05
	T. mentagrophytes	24	88.9	3	11.1	>0.05
	T. verrucosum	11	100	0	0	>0.05
	T. violacerum	5	50.0	5	50.0	<0.05
	Other species	9	60.0	6	40.0	>0.05

The cure rate in the lesion area group was less than 5%, 78.8% higher than that in the above 5% group, 70.6%, the difference was statistically significant with p <0.05. Our results are similar to those of Priyanka Sharma (2019), Nguyen Thai Dung (2017) [6], [9]. Perhaps the low lesion area responds to better treatment, so for patients with extensive lesions, an additional topical application was needed in the treatment. Regarding pathogenic fungal strains, we also found that itraconazole was more effective against *T. tonsurans* than the remaining strains, the difference was statistically significant with p <0.05. In an invitro study, Adimi et al. (2013) showed that the minimum inhibitory concentration of MIC of itraconazole and terbinafin was 1-3 x103 CFU / ml, equivalent to each other [10]. Another study comparing itraconazole and terbinafin found similarities in the treatment of superficial fungal disease in general and trunk fungi in particular [6]. We thought that itraconazole was more effective in treating tinea corporis caused by *T. tonsurans*.

Table 3.3. Side effect (n=116)

Side effect		n	%
Yes	Dizzyness	1	0,9
	Nausea	8	6,9
	Flatutent	3	2,6
No		104	89,6
Total		116	100

In the study, the side effects were very little, only 10.4%, of which mainly nausea. This result was similar to the study of Priyanka Sharma (2019) in a comparison study of terbinafin and itraconazole for fungal skin infections, the most common side effect was digestive disorders (3/20 = 15%) [6]. Boonk W.'s study also showed similar results, with the incidence of side effects after 6 weeks of treatment in 13 patients taking 100mg daily for 2 weeks and 9 patients taking 200mg daily in 1 week [5]. This study also showed that two patients were forced to discontinue treatment due to side effects of the drug in the 200mg group daily for 1 week. In our study, no patients had to be dwascontinued, the side effects were only transient and noted. We believe that itraconazole 200mg daily for 1 week was safe for the treatment of trunk fungus.

IV. CONCLUSION

Itraconazole was effective and safe in the treatment of mycosis. The cure rate for fungus was high at 88.8%. Clinical symptoms changed significantly after treatment, the difference was statistically significant. The overall cure rate was 77.6%, and the improve was 22.4%. Side effects are rare, only 10.4%, mainly nausea.

REFERENCE

1. **Vena G.A., Chieco P., Posa F. et al (2012)**, Epidemiology of dermatophytoses: retrospective analysis from 2005 to 2010 and comparison with previous data from 1975, *New Microbiol*, **35**(2), 207-213.
2. **Shivanna R., Inamadar A. (2017)**, Clinical failure of antifungal therapy of dermatophytoses: Recurrence, resistance, and remedy, *Indian Journal of Drugs in Dermatology*, **3**(1), 1-3.
3. **Lee W.J., Sim H.B., Jang Y.H. et al (2016)**, Skin Infection due to Trichophyton tonsurans Still Occurs in People in Korea but not as Outbreaks, *J Korean Med Sci*, **31**(2), 296-300.
4. **Hay R. (2018)**, Therapy of Skin, Hair and Nail Fungal Infections, *J Fungi (Basel)*, **4**(3).
5. **Boonk W., de Geer D., de Kreek E. et al (1998)**, Itraconazole in the treatment of tinea corporis and tinea cruris: comparison of two treatment schedules, *Mycoses*, **41**(11-12), 509-514.
6. **Sharma P., Bhalla M., Thami G.P. et al (2019)**, Evaluation of efficacy and safety of oral terbinafine and itraconazole combination therapy in the management of dermatophytosis, *Journal of Dermatological Treatment*, 1-5.
7. **Kumar Amit, Budania Navin, Sharma Priyamvada et al (2013)**, A comparative study of efficacy of terbinafine and fluconazole in patients of tinea corporis, *Int. J. Pharm. Med. & Bio. Sc.*, **2**(4), 92-98.

8. **Bhatia A., Kanish B., Badyal D. et al (2019)**, Efficacy of oral terbinafine versus itraconazole in treatment of dermatophytic infection of skin: A prospective, randomized comparative study, *Indian Journal of Pharmacology*, **51**(2), 116-119.
9. **Nguyễn Thái Dũng (2017)**, *Nghiên cứu một số đặc điểm và kết quả điều trị nấm da ở bệnh nhân đến khám và điều trị tại trung tâm chống Phong-Da liễu Nghệ An 2015-2016*, Luận án Tiến sĩ Y học,Luận án Tiến sĩ Y học. Đại học Y Hà Nội, Hà Nội.
10. **Adimi P., Hashemi S.J., Mahmoudi M. et al (2013),** In-vitro Activity of 10 Antifungal Agents against 320 Dermatophyte Strains Using Microdilution Method in Tehran, *Iran J Pharm Res*, **12**(3), 537-545.

DIRECT MICROSCOPIC EXAMINATION WITH KOH AND PARKER BLACK INK IN TINEA VERISCOLOR IN HA NOI, VIET NAM

Tran Cam Van*, Le Duc Anh**

ABSTRACT

Objectives:Comparing the value of DME by cellophane tape with KOH in combining parker black ink and using only 20% KOH.

Population and methods: 72 patients with TV who were used direct microcopic examination (DME) by only KOH 20% or combined with PBI (3:1).

Results: the positive test rate of the PBI combination group is 97.2% higher than that of the KOH group at 90.3%.

Conclusion: DME Malassezia with cellophane tape and KOH combined with PBI (3: 1) showed a higher positive rate than KOH alone. the average time to complete test of combining KOH and parker black ink is 46.7 ±10.5 (minutes) faster than KOH 72.2 ± 17.7(minutes).

Keyword: Tinea versicolor, KOH, Parker black ink.

I. INTRODUCTION

Tinea versicolor (TV) is a chronic, recurrent, superficial fungal skin disease caused by *Malassezia*. There are many methods to determine *Malassezia* spp. such as wood light, direct examination, identification culture, PCR,... in which direct microscopy examination(DME) which is fast, accurate, very useful clinical diagnosis and treatmentis an important first step to identify the fungus species. [1]. Currently, the methods which collect specimens is mainly with a blunt scalpel, but sometimes it is fear of uncooperative, especially children, even unable to collect the specimens in some cases such as face, groin, genital... Besides, using 20% KOH is difficult to findwhen the cells are not intact, the hyphae structure is not continuous and the cytoplasm is not blue. Therefore, it is necessary to improve the DME withpink, in which parker black ink plays a role as finding with yeast cells[2], [3], [4]. So we conducted the study with the objection of comparing the value of DMEbycellophane tape with KOH in combining parker black ink and using only 20% KOH.

II. OBJECT AND METHOD

2.1. Object

From november 2018 to april 2019, wechose72 patients with TV who were used direct microcopic examination (DME) by only KOH 20% or combined with PBI(3:1).

Patient with TV were included: pigmentedmacule (white, brown, pink or mixed colors), anatomical sites (back, chest, belly, shoulder, neck, face). Patients were exclusion if using antifungal or keratolyticdrug within 7 days ago.

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2.2. Study method.

- Design: Descriptive cross - sectional study

- Sample size:caculated with clinical test formula by the World Health Organization (WHO): $n= Z^2_{1-\alpha/2} \times \frac{p(1-p)}{(p\varepsilon)^2}$, inside p=0,8, ε=0,12, the result was n=67.

2.3. Steps to conduct research

The specimens from patient with TV will be taken with cellophane tape. Then, Samples are treated by one of two methods: combining KOH 20% and PBIat a ratio of 3: 1 or using only 20% KOH.

Test results will be assessed under a microscope at 10x and 40x objectives: "Hyphae and yeast" if they are seen as short, curved hyphae and spherical yeast, giving a characteristic “spaghetti and meatballs” appearance; "Hypahe" if they are seen as short, curved hyphae; “yeast cells” if they are seen as spherical yeast. In particular, the number of yeast cells was evaluated according to the standards of Nguyen Huu Sau et al[1]:

- Negative (Total of 4 or fewer yeast cells per high power field);
- 1+ (More than 5 but less than 14 yeast cells);
- 2+ (More than 15 but less than 29 yeast cells);
- 3+ (More than 30 but less than 39 yeast cells);
- 4+ (More than 40 yeast cells).

III. RESULT

Table 1. Dermographic of patient with TV

Characteristic		n	%
Ages	0-9	14	19.4
	10-19	8	11.1
	20-29	27	37.5
	30-39	15	20.8
	40-49	5	6.9
	>50	3	4.2
	X ± SD(min-max)	23.7 ±14.0(1-60)	
Gender	Male	49	68.1
	Female	23	31.9
Pigmented macule	Hyper	29	40.3
	Hypo	32	44.4
	Erytherma	11	15.3
Sites	Head	2	2.8
	Face	8	11.1
	Neck	7	9.7
	Back	52	72.2
	Chest	60	83.3
	Upper climb	15	20.8
	Lower climb	2	2.8
	Armpit and groin	13	18.1
Total		72	100

In 72 patients, we found that the average age is 23.7 ± 14.0, the lowest age was 1 year, the highest was 60 years. The male rate was 68.1%, higher than female was 31.9%, the male perfemale ratio is approximately 2:1. Lesions with hypopigmented and hyperpigmentedwere mainly, erytherma was less common. The chest is the most common sites, accounting for 83.3%.

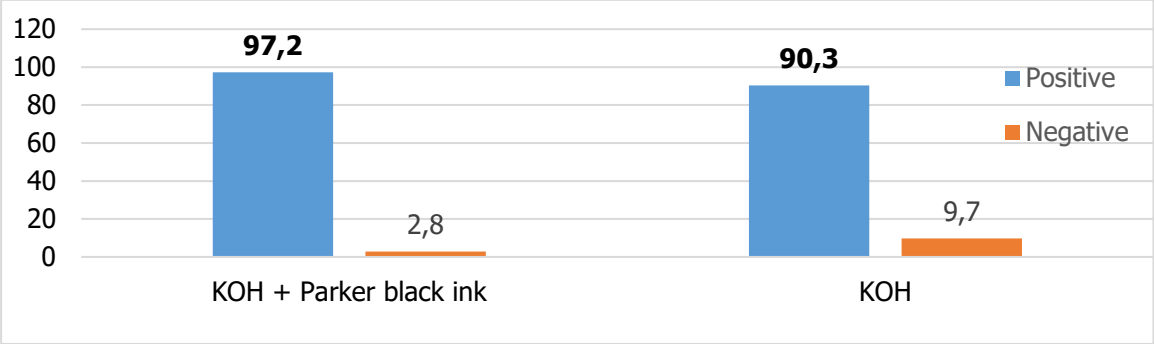

Figure 1. The result of DME of two methods

The diagnostic value of a test technique is the positive rate. Figure 1 shows that the positive test rate of the PBI combination group is 97.2% higher than that of the KOH group at 90.3%. This result is similar to that of Nguyen Huu Sau (2018), the positive rate when using the two NaOH methods combined with parker blue black ink and KOH were 81.3% and 76.3%, respectively [1]. We believe that the use of PBI is more positive rate than the KOH because this is a pigment ink that is affinity for yeast cells, when dyeing the fungus will easily catch the color, thereby helping to identify the structure. Fungal structure is more pronounced and easier, avoiding confusion and omission.

Table 2. The time to complete test of DME of two methods

Time to complete test	**Cellophane**			
	KOH + Parker black ink		**KOH**	
	n	**%**	**n**	**%**
< 30 min	5	7.0	3	4.2
30 - 60 min	49	68.0	25	34.7
60 - 90 min	18	25.0	34	60.1
Total	72	100	72	100
X ± SD (min-max)	46.7 ±10.5(15-60)		72.2 ± 17.7(15-90)	
p	<0.001			

Our results show that using PBI results faster than KOH alone by 25-30 minutes. The author Remya in a 2017 study compared the cellophane tape and Pugh ink methods with the blunt scalpel with KOH, which takes 4-5 minutes[4]**.** According to Nguyen Huu Sau et al, the average time to complete test of combining NaOH and parker blue black ink is 49.4 ± 14.4 (minutes) faster than KOH 61.8 ± 16.8 (minutes)[1]. Our results are similar to previous studies because KOH is strongly alkaline and has good permeability to soften the keratinocyte. When combined with an affinity for yeast cell PBI will create contrasting background, hyphyae staining so it is easy to observe.

Table 3. Influencing on morphological identification and number of yeast cells of two methos

		Cellophane				p
		KOH + Parker black ink		KOH		
		n	%	n	%	
Apperances						
Hyphae and yeast	Easy	47	67.1	39	60.0	<0.05
	Difficult	2	2.9	10	15.4	
Hyphae	Easy	8	11.4	5	7.7	>0.05
	Difficult	4	5.7	2	3.1	
Yeast cells	Easy	8	11.4	3	4.6	<0.05
	Difficult	1	1.4	6	9.2	
The number of yeast cells						
Negative	0-4	0	0	0	0	--
Positive	3+	2	22.2	3	33.3	--
	4+	7	77.8	6	66.7	--

Compared to using a blunt scalpel, the cellophane tape play role as a skin biopsy, removing the entire stratum corneum from the surface of the skin but not changing the structure of the skin layers[5]. We found that the method of using PBI has advantages compared to using KOH merely when identifying species. Using PBI makes it easier to observe the structure of the fungus due to its softening keratin layer quickly, and PBIk helps to catch fungal colors even when hypahe or yeast cell, even if the patient has been used antifungal[2]. Besides, when the fungus catches the color, it will help to distinguish the yeast structures from the walls of kerationcytes, fat cells. This method has useful practices in subclinical diagnostic tests.

IV. CONCLUSION

DME Malassezia with cellophane tape and KOH combined with PBI (3: 1) showed a higher positive rate than KOH alone. In particular, the advantage over the time to complete the test, the identification of morphology and the number of fungal cells.

REFFERENCES

1. **Tran Cam Van, Nguyen Huu Sau (2018)**, *Research using a number of diagnostic techniques to identify malassezia causing tinea versicolor in Hanoi*, Ha Noi.
2. **Anggraeni Noviandini, Sunarso Suyoso, Linda Astari (2017),** Parker ink-KOH stain, Chicago Sky Blue (CSB) stain, and Fungi Culture, for The Diagnosis of Superficial Dermatomycoses *Berkala Ilmu Kesehatan Kulit dan Kelamin - Periodical of Dermatology and Venereology*, **29**(1),21-29.
3. **Navya B., Golia S. (2017)**, Comparison of KOH Mount Using Standard Technique and Cellophane Tape Method for Diagnosis of Superficial Fungal Infections,*Int. J. Curr. Microbiol. App. Sci*, **6**(10),494-499.
4. **Remya V. S, Arun B, Usha Karunakaran et al (2017)**, Cellophane Tape Pugh's Staining a Novel Contrast Staining Method for Rapid Detection of Fungal Elements of Malassezia in Tinea versicolor, *Int J Health Sci Res*, **7**(11),42-46.
5. **Lodha N., Poojary S.A. (2015)**, A Novel Contrast Stain for the Rapid Diagnosis of Tinea versicolor: A Comparison of Chicago Sky Blue 6B Stain, Potassium Hydroxide Mount and Culture,*Indian J Dermatol*, **60**(4),340-344.

4

THE POTENTIAL OF STR IN IDENTIFY OF MONOSOMY: CASE REPORT

Dang Tien Truong*, Bui Thu Anh*, Nguyen Thanh Tung*

ABSTRACT

Short tandem repeat (STR) analysis is a technique that is used very popularly in genetic diagnosis and paternity disputes. We apply this technique to preimplantation genetic testing for monogenic disorders (PGT-M) - alpha thalassemia. In our case, embryo 5 had allele drop-out (ADO) on all foreign genetic markers; techniques combined with PGS shows that embryo was monosomy 16. This indicates that the potential STR markers to detect monosomy and large deletions, that should be interested in research and development in the future.

Keywords: *Short tandem repeat, Preimplantation genetic testing, monosomy.*

I. INTRODUCTION

Short tandem repeat (STR) analysis, one of the most tools of molecular biology, is used effectively in forensic spacious, paternity tests and diagnosis of genetic diseases. STR is a set of 10-60 repetitions sequences from 2 to 6 bp, and the individual characteristics of each of the STR allow identification of individual DNA or genetic analysis of the link between the generation in the same family. STR amplification products of approximately 100-500 bp can proceed multiplex PCR using primers attached different fluorescent colors to distinguish [8].

Preimplantation genetic testing for monogenic disorders (PGT-M) is a method of screening embryos (in vitro) is performed to identify embryos without genetic abnormalities to inoculate the mother's uterus. Thus, PGT-M helps to reduce the risk of genetic disease to the next generation, avoid situations must suspend pregnancy causes psychological impact to the patient and, the complications caused by the suspension pregnancy while increasing the ability to of a pregnancy. This method must proceed through whole-genome amplification (WGA). Then selection of STR loci was amplified in a STR-multiplex PCR reaction, however allele - drop out rate (ADO) is very large, up to 25% [1].

Preimplantation genetic testing for Aneuploidy (PGT-A) for In Vitro Fertilization (IVF) was first developed by Handyside et al. in 1990 [2]. PGT-A allows identification of abnormal numbers of chromosomes as monosomy, trisomy, tetrasomy or changes in the structure greater than 16 Mb. In this technique, a biopsy of one cell from day 3 or a few cells from day 5 or 6 embryos was physically performed under a dissecting microscope. The genetic information of the blastomeres will be analyzed by multiplex quantitative PCR or Next-Generation Sequencing (NGS) to identify abnormal number of chromosomes facilitate choice healthy embryos to serve implanted transfer [3]. PGT-M and PGT-A together support to determine the genetic abnormalities of each couple. Especially in Vietnam, alpha thalassemia is a common

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genetic disease caused by mutations of *HBA* gene, alpha globin chains do not aggregate or loss of function. Anemia disease from mild to severe can cause swelling and miscarriages, babies born retarded and can lead to death. Depending on the severity of the disease that patients often require blood transfusion or batch lifetime [4]. So this is a very interesting disease and noted when screening before embryo transfer.

II. CASE REPORT

We report here a case of a 38-year-old Vietnamese woman diagnosed with heterozygous SEA deletions ($--^{SEA}/\alpha\alpha$), her husband (38-year-old) diagnosed with heterozygous HbCs point mutations ($\alpha\alpha/\alpha^{CS}\alpha$). PGT-M and PGS were performed before embryo transfer. The couple had a daughter 14 years old with anemia because of carrying mutations in parents, their second daughter (4 years old) was carrier of thalassemia. PGT-M results in 5 embryos in which one embryo was biallelic of SEA deletions and HbCs mutations ($--SEA/\alpha^{CS}\alpha$); One embryo (I3) had no mutation allele; One embryo (I4) had heterozygous of HbCs mutations ($\alpha\alpha/\alpha^{CS}\alpha$); Two embryo (I1 and I5) were heterozygous of SEA ($--^{SEA}/\alpha\alpha$); embryo (I5) had ADO on many markers (6/8 STR markers). Embryos I1, I3, I4, I5 were continued screening numeral chromosome and large deletions by NGS techniques. Results showed that embryo I5 PGS was monosomy 16, explain why the rate ADO happens very much.

III. MATERIALS AND METHODS

Genomic DNA was extracted from 200 uL blood samples of parents and two children using the QIAamp DNA Mini Kit (Qiagen); whole genome amplification of embryos using REPLI Kit (Qiagen) was performed according to manufacturer's instructions. STR amplification marker system detected pathogenic mutations in alpha thalassemia using multiplex PCR method and analysis gene linkage by Genemapper 4.2 software; components in a 50 µL PCR reaction include 2x QIAGEN Multiplex PCR Master Mix, 1x Q-Solution, 50-100 ng of DNA, 8 STR primers (Figure 1). The multiplex-PCR consisted of steps: 95 ^{0}C 15 min, 30 cycles (98 ^{0}C 45 seconds, 60 ^{0}C 90 seconds, 72 ^{0}C 66 seconds), 60 ^{0}C for 30 minutes, 11 ^{0}C∞.

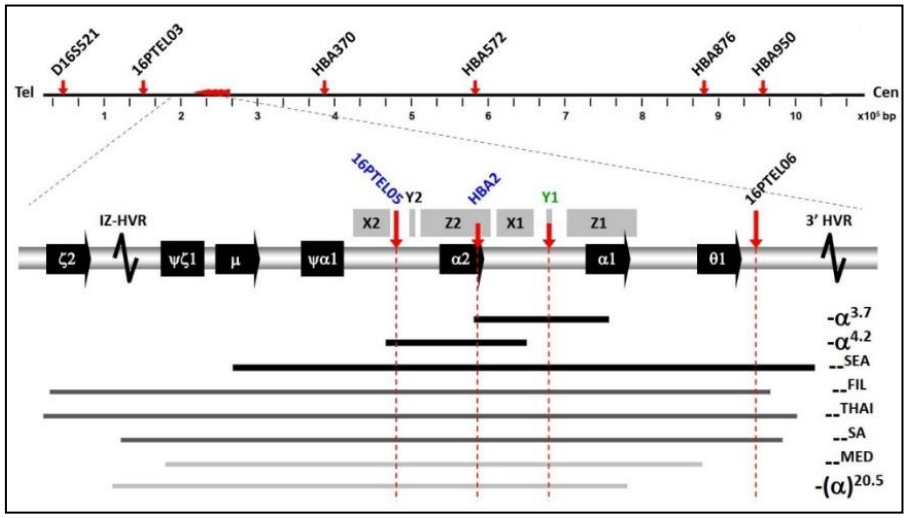
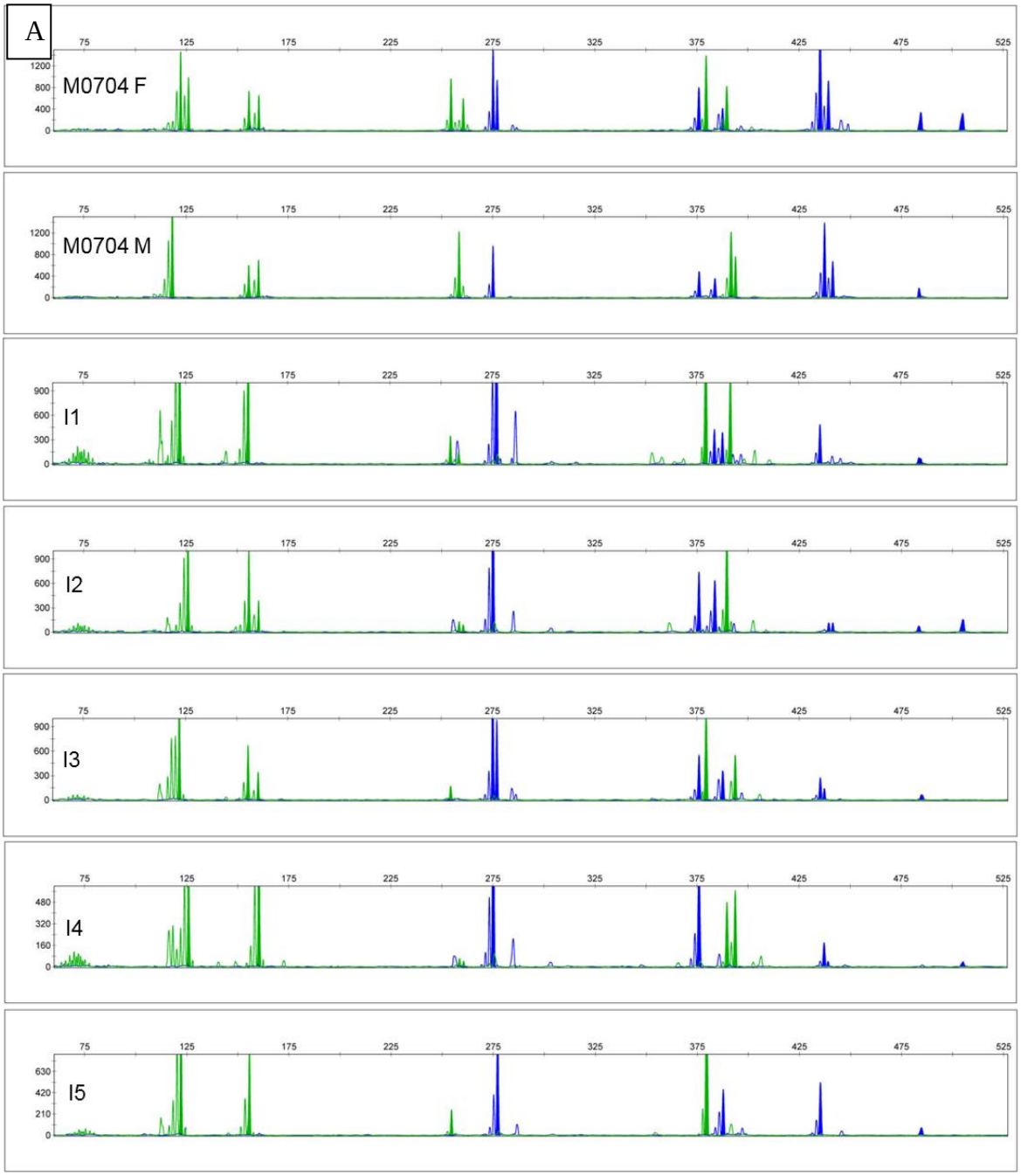
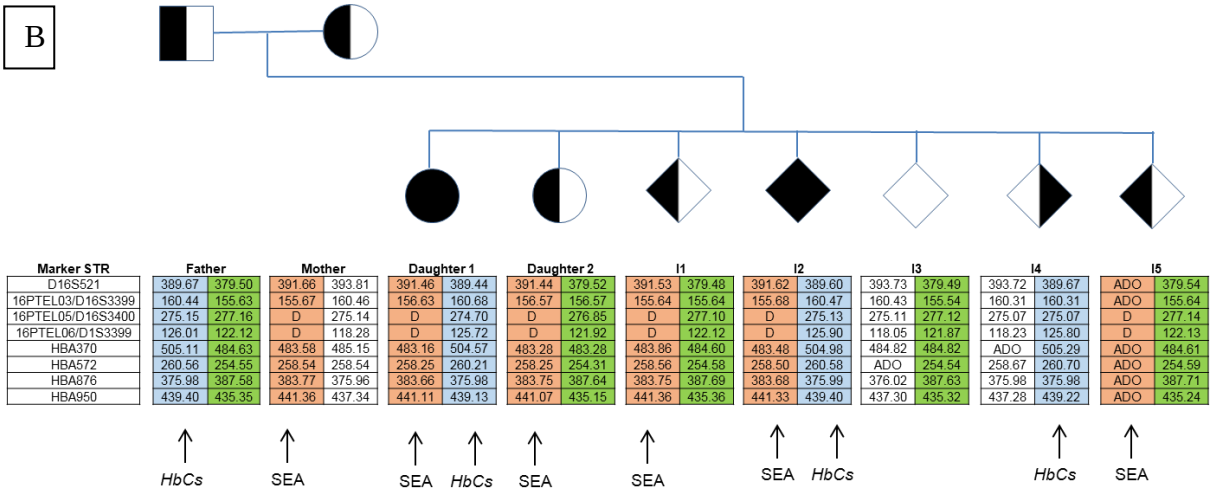


Figure 1: Diagram location of STR primers on chromosome 16.

We performed analysis of STR twice, the first run with DNA samples of parents and children to identify genes linked diagram, 2nd run with embryo form to determine genotypes of embryos. STR analysis results were shown in Figure 2; showed two embryos I3 and I4 were not carrying deletion SEA allele. Embryos I1, I2, I5 were carrying deletion SEA allele, I5 embryo had two internal STR marker representatives for SEA deletion, six foreign STR markers on alpha globin gene occurs ADO.





Marker STR	Father		Mother		Daughter 1		Daughter 2		I1		I2		I3		I4		I5	
D16S521	389.67	379.50	391.66	393.81	391.46	389.44	391.44	379.52	391.53	379.48	391.62	389.60	393.73	379.49	393.72	389.67	ADO	379.54
16PTEL03/D16S3399	160.44	155.63	155.67	160.46	156.63	160.68	156.57	156.57	155.64	155.64	155.68	160.47	160.43	155.54	160.31	160.31	ADO	155.64
16PTEL05/D16S3400	275.15	277.16	D	275.14	D	274.70	D	276.85	D	277.10	D	275.13	275.11	277.12	275.07	275.07	D	277.14
16PTEL06/D1S3399	126.01	122.12	D	118.28	D	125.72	D	121.92	D	122.12	D	125.90	118.05	121.87	118.23	125.80	D	122.13
HBA370	505.11	484.63	483.58	485.15	483.16	504.57	483.28	483.28	483.86	484.60	483.48	504.98	484.82	484.82	ADO	505.29	ADO	484.61
HBA572	260.56	254.55	258.54	258.54	258.25	260.21	258.25	254.31	258.56	254.58	258.50	260.58	ADO	254.54	258.67	260.70	ADO	254.59
HBA876	375.98	387.58	383.77	375.96	383.66	375.98	383.75	387.64	383.75	387.69	383.68	375.99	376.02	387.63	375.98	375.98	ADO	387.71
HBA950	439.40	435.35	441.36	437.34	441.11	439.13	441.07	435.15	441.36	435.36	441.33	439.40	437.30	435.32	437.28	439.22	ADO	435.24

Figure 2: Results of capillary electrophoresis STR (A) and genetic genealogy of family studies (B). Embryos I1 and I5 were SEA deletions heterozygous, embryo I2 was carrying both two alleles disease, embryo I3 was not carrying the disease allele, embryos I4 was carrying HbCs mutations heterozygous. D: Loss of DNA, ADO (Allele dropout): Loss of alleles, unidentifiable information. Orange represented the allele was SEA deletion, blue represented the HbCs mutant allele, white and green represented the normal allele of the mother and father.

HbCs point mutations were identified by The SNaPshot® Multiplex System (Applied Biosystems - Thermo Fisher Scientific). First, 5 uL PCR products containing the mutation were incubated with 1.5 µL enzyme mixtures, containing 5 units exonuclease I (ExoI) (USB Corporation) and 1 unit shrimp alkaline phosphatase (SAP) (USB Corporation), incubated 37° C for 15 minutes, followed by 80^{o} C for 15 minutes. Then minisequencing reaction was performed with PCR products were purified using SNaPshotT Multiplex kit (Applied Biosystems) and 0.2 µL minisequencing primer as instructed by the manufacturer. Capillary electrophoresis on 3130XL system. Analysis of results by software Genemapper 4.2. Results of minisequencing were presented in Figure 3.

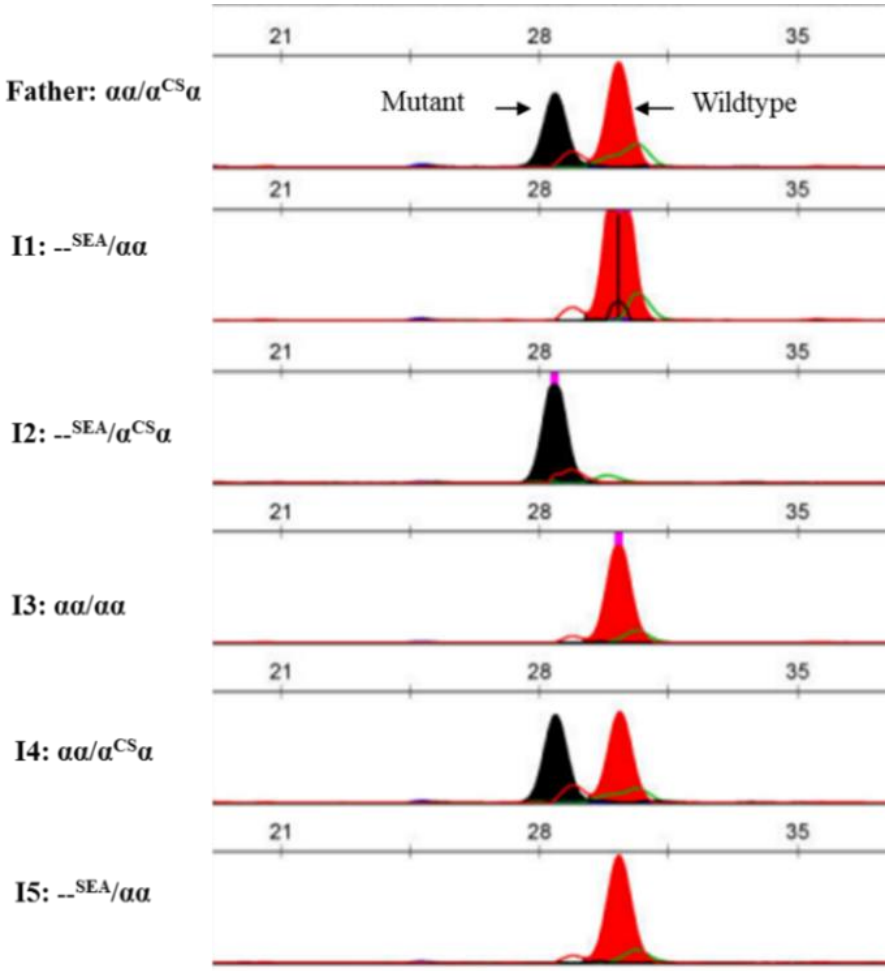


Figure 3: Results minisequencing identified HbCs point mutations. LIZ-120 marker

Results minisequencing showed that embryos I1, I2, I5 had non-mutant allele HbCs. Embryos I2 and I4 were carrying HbCs mutations. We combined with results STR to identify genotypes 5 embryos (Table 1).

Table 1: Results determined genotypes of 5 embryos.

Embryos	Genotype
I1	--^{SEA}/αα
I2	--^{SEA}/α^{CS}α
I3	αα/αα
I4	αα/α^{CS}α
I5	--^{SEA}/αα

These embryos were selected after PGT-M method will had been further screened by PGS. We amplified and generate a library of DNA by Veriseq PGS kit; DNA sequencing by Miseq - Illumina system; analysis of results by software BlueFuse 4.4. Four embryos I1, I3, I4, I5 after screening PGT-M continues to be conducted by PGS. Results showed that three embryos normal and embryos I5 was monosomy 16 (Figure 4).

IV. DISCUSSION

Monosomy is a form of aneuploidy with the presence of only one chromosome from a pair. The most monosomy common is monosomy X (Turner syndrome). Monosomy 16 is an extremely rare genetic disorder in which affected individuals have a large loss of genetic material (monosomy) on chromosome 16 in which several adjacent genes are lost. Symptoms include intellectual disability, clubfoot, a head circumference that is smaller than would be expected based upon an infant's age and gender (microcephaly), and alpha thalassemia [7].

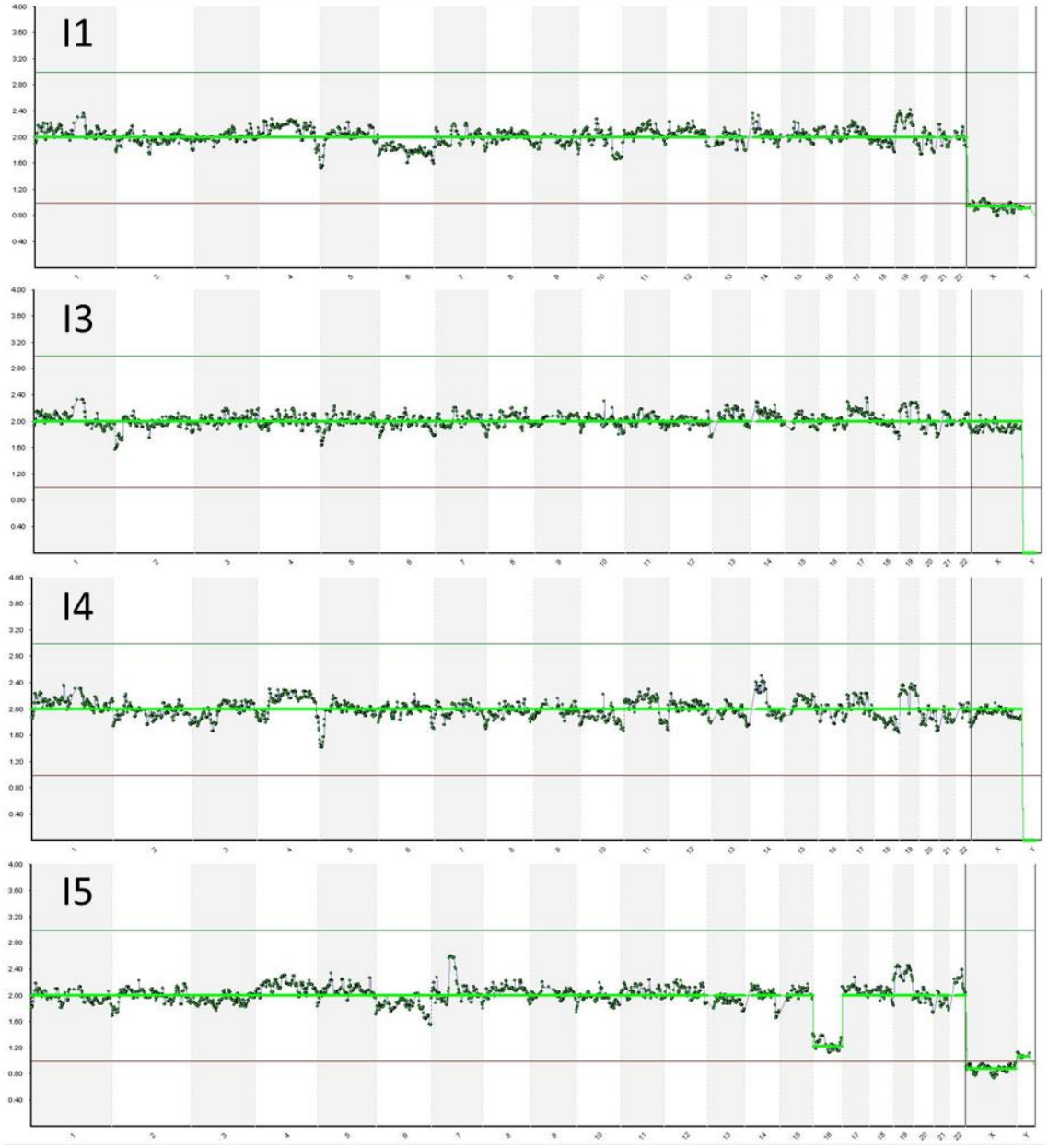


Figure 4: Results amplification PGS and DNA library created by Veriseq PGS Kit; DNA sequencing by Miseq - Illumina system; analysis of results by BlueFuse 4.4 software. Embryos I1, I3, I4 were normal; I5 was monosomy 16 embryos.

PGT-A results showed that embryo I5 was monosomy 16. STR analysis results showed that two internal genetic STR markers represent SEA deletions, six STR markers in both sides of HBA cluster in chromosome 16 occurs ADO. Such cases could not be identified allele (not appear pick of STR markers) throughout the system may represent deletions or monosomy based on the distribution of the marker. According to the results showed that if the ADO rate was 25%, the ADO's 8 marker ability was very small about 0.00152%, probability of monosomy or deletions on chromosome 16 of up to 99.998%; including monosomy approximately 10.011%, the deletion was about 89.987% [1].

In 2006, research by G. A Gradek and colleagues used STR markers had identified about 6.7 to 10 Mb large deletions on chromosome 8 [5]. Then STR markers continued to be used successfully to determine the 2.4 Mb deletion of *PCDH9* gene on chromosome 13 cause deafness disease [6]. However studies using STR determine monosomy is limited, especially in Vietnam, our study is the first study to use STR to determine monosomy 16. Thus the use of STR, beyond classification integrated genetic linkage, this marker also shows the potential to identify large deletions and monosomy.

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V. CONCLUSION: This was first report of potential STR analysis of monosomy 16.

REFERENCES

1. **Harton, G.L., et al.,** *ESHRE PGD consortium best practice guidelines for amplification-based PGD.* Hum Reprod, 2011. **26**(1): p. 33-40.
2. **Handyside, A.H., et al.,** *Pregnancies from biopsied human preimplantation embryos sexed by Y-specific DNA amplification.* Nature, 1990. **344**(6268): p. 768-70.
3. **Li, P., et al.,** *Preimplantation Genetic Screening with Spent Culture Medium/Blastocoel Fluid for in Vitro Fertilization.* Sci Rep, 2018. **8**(1): p. 9275.
4. **Farashi, S. and C.L. Harteveld,** *Molecular basis of alpha-thalassemia.* Blood Cells Mol Dis, 2018. **70**: p. 43-53.
5. **Gradek, G.A., P.H. Kvistad, and G.** Houge, *Monosomy 8 rescue gave cells with a normal karyotype in a mildly affected man with 46,XY,r(8) mosaicism.* Eur J Med Genet, 2006. **49**(4): p. 292-7.
6. **Grati, F.R., et al.,** *Pure monosomy and pure trisomy of 13q21.2-31.1 consequent to a familial insertional translocation: exclusion of PCDH9 as the responsible gene for autosomal dominant auditory neuropathy (AUNA1).* Am J Med Genet A, 2009. **149a**(5): p. 906-13.
7. **Gibbons R. J.,** ATR-16 Syndrome, National Organization for Rare Disorders. 2015.
8. **Edwards A., Civitello. A., Hammond H.A. and Caskey C.T. (1991),** *DNA typing and genetic mapping with trimeric and tetrameric tandem repeats*, Am. J. Hum. Genet., 1991. **49:** p. 746-756.

IDENTIFYING INDICATIONS OF TOT SURGERY FOR THE TREATMENT OF FEMALE STRESS INCONTINENCE

Mai Trong Hung*, Vu Huy Nung**, Le Anh Tuan**

ABSTRACT

Objectives: We conducted this study with the aim to identify the indications of TOT surgery for the treatment of female stress incontinence.

Subjects and methods: A cross-sectional study of 74 women with stress urinary incontinenceunderwent the procedure in Hanoi Obstetrics and Gynecology Hospital. The study was conducted from 1/1/2013 - 5/2018.

Results and conclusions: Patients with urination (100%) or associated with dysuria (80.7%), or genital prolapse (96.8%). Patients with associated urination have urination disorders such as exertion during urination, urgency (urination) (58.1%), or a combination. Patients with urinary incontinence accompanied by urination disorders such as concomitant bowel movements (19.4%), accompanied by inactive bowel movements (29%). When examining the condition of the muscles of the bladder, urethra: positive Valsalva tests; positive cough test (100%). The amount of residual urine measured by catheterization > 100 ml, and the feeling of wanting to urinate but difficult to urinate. (100%). Maternity status, number of pregnancies, number of births, heaviest birth weight and method of delivery are factors that influence the indications for TOT surgery.

Keywords: *indication of surgery, TOT surgery, treatment of female stress incontinence*

I. BACKGROUND

Uncontrolledurination, asdefined by the International Continents Society (ICS) for uncontrolled urination: "Uncontrolled urination or urination is an unexplained urinary outflow will, is a social and sanitary issue related to complaints of quality of life ". The disease is mainly found in women, urinary incontinence is a major disease affecting the life, psychophysiology, work, and quality of life around the world. The rate in general of incontinence in the community varies from 25 - 45% [1].

Uncontrolled urination is a psychological burden that reduces the quality of life. Since the first American American Obstetrics & Gynecologist Howard Kelly (1914) first published the technique of exertion of urinary incontinence [2], many studies have been conducted on urinary physiology, pathogenesis, epidemiology and preventive treatments have been implemented to reduce the burden of disease on women. However, incontinence has not been reported and adequate treatment has been addressed in some countries [3].

In Vietnam, due to the current economic conditions and oriental culture, the patient was afraid to go to the hospital, so this

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condition is rarely mentioned at major hospitals and in the community. Understanding the clinical profile of urination in women and the factors involved as well as evaluating current surgical treatment for urination will provide useful information for future treatment and prevention.

In Vietnam, female stress incontinence surgery with TOT (trans obturator tape) has only been applied in recent years, although there are many advantages there is no comprehensive research on indications, techniques and effectiveness of this surgery. So we conducted this study with the goal: determining the indications of TOT surgery for the treatment of female stress incontinence.

II. SUBJECTS AND METHODS

2.1. Subject, location and time

A cross-sectional study of 74 women with stress urinary incontinenceunderwent the procedure in Hanoi Obstetrics and Gynecology Hospital. The study was conducted from 1/1/2013 - 5/2018.

2.2. Research design

Researchdesign: Apply a cross-sectional descriptive researchmethod.

Samplesize:Weapplied the entire sampling method.

* Inclusion criteriaincluding:

- The patients werediagnosedconfirmed

- Patients withurinarydisorders come to hospital

-Patients agree to cooperatewithconditionalresearch post-surgery monitoring.

- Eligibility ofsurgery.

*** Exclusion criteria:**

- All patients do not have surgical indications due to general and local conditions withoutanesthesia or anesthesia conditions.

- Patients do not agree to participate in the study.

- Urinary incontinence patient without a surgical indication.

*** Researchoutcomes:**

- Questioning and clinicalexamination of patients coming to examine, exploit medicalhistory and history (according to the sample of the research records), explain to the patients for researchcooperation.

- Conductclinicalexamination to select patients with urination.

*** Processing and analyzing data**

All information recorded on the patient is entered into the variable table of STATA 12.0 statistical software. Use appropriate statistical algorithms Descriptive statistics: Statistical analysis (Chi-square test, Fisher exact test, t used test, Wilcoxon rank-sum test). Pearson's correlation coefficient is also calculated when considering the correlation between quantitative variables in the study. Tests are considered to be statistically significant (ie with difference or relevance) when the value p is <0.05. When OR is used, the 95% confidence interval of OR passing 1 is considered not statistically significant.

*** Ethical issues**

The research process always ensures compliance with GCP rules - good clinical trials of the Ministry of Health and ICH. During the research process, the researcher always ensures to adhere to the research protocol.

III. RESULTS AND DISCUSSION

Table 1: Patient demographics

Indexes	Number (X ± SD)	Percentages (Min-Max)
Age	55,3 ± 10,8	30-83
Maternal age(30-50)	20	27,0%
Out of maternal age (>50)	54	73,0 %
Occupation		
Farmer	21	28,4
Woker	7	9,5
Officer	8	10,8
Other worker	3	4,0
Others	35	47,3
Education		
Not	6	8,1
Degree level 1	22	29,8
Degree level 2	24	32,4
Degree level 3	8	10,8
Collage - University	5	6,7

The results in Table 1 show that the average age of a patient is 55.3 ± 10.8 with the lowestis 30 years old and the highest is 83 years old. Of these, 73% have aged beyond the maternal age. The disease occurs in all professions and education levels.

Our results were higher than those of Ho Nguyen Tien with urinary incontinence treatment when surgery placed Bandelette under the urethra of 51.8 ± 11.9 (the lowest was 39 and the highest was 67 years old.) [3] and Nguyen Tan Cuong in the treatment of urinary incontinence in women with urethral augmentation is 49.8 ± 7.2 (the lowest is 33 and the highest is 69) [4]. uniformly, the incidence of urine incontinence increased with age [6], [7]. Age> 40 has a higher risk of urination (RR = 2, 16, CI = 1, 86 - 2, 57) [7]. Because of its prevalence in the elderly, urination is considered the inevitable normal progression of age. However, urine incontinence should not be considered normal in the elderly, although changes in the bladder and organization in the sub-framework contribute to the occurrence of disease [8].

The proportion of patients with farming occupations accounted for the highest proportion of 29%, followed by workers with 16.1%. Groups of civil servants and hired laborers account for less than 9.7% and 6.5%. Our results are also consistent with the results of Nguyen Thi Tan Sinh, this rate is consistent with the situation of work and the working time of patients who have undergone [9].

Table 2. Distribution of patients by maternity status (n = 74)

Maternity status	**Number**	**Percentage (%)**
Used to be pregnant	74	100
Number of births ≤ 2	12	16.2
Number of births 3-4	42	61.3
Number of births> 4	20	27.0
Vaginal discharge	56	75,7
= 1	22	29,7
> 1	34	46,0
Averge time	2,7 ± 1,0	(1 - 6)

The number of people who are pregnant and have given birth is 100% of the cases. The number of people who ever did family planning - abortion was 56 cases, accounting for 75.7%.The average number of births in the study group was 2.7 ± 1.0. The number of people who have experienced 3-4 pregnancies is 42 cases, accounting for 61.3%. The number of people who ever sucked once was 22 cases, accounting for 32.2%.

The results showed that the number of pregnancies and the number of abortions as well as the number of births, the weight of the baby at birth also affect the urination condition of the patient. Our results are also consistent with author Nguyen Tan Cuong (average number of births 2.5 times and the highest to 10 pregnancies) [4] and author Ho Nguyen Tien (average number of children is 3, 4 ± 1,6, the lowest is 1 and the highest is 6) [3]. The number of vaginal births affects the dilatation of the perineum. In our study, the number of birth patients ≥ 2 times accounted for 87.1%. According to Nguyen Tan Cuong, the number of patients with delivery more than 2.5 times accounted for 63% of the total numberofpatientsundergoing TOT surgery [4].

Table 3. Distribution of patients by incontinence status (n = 74)

Incontinence status	**Number**	**Percent(%)**
Nocturia	74	100,0
Urine repeatedly / once	27	36,5
Pee hard to push	61	82,4
The urine flows out without a feeling of urination	21	28,4
After finishing, I still want to go but don't come out	47	63,5
Must urinate urgently	44	59,5
Urinary incontinence when exertion	42	56,8
Having suffered from urinary urgency	32	43,2
Urinating during sex	10	13,5

In the sample size of the sample, the number of people who have to urinate at night is 100%, the difficulty of pushing the urine is 82.4%, the urge to urinate but still wants to go but is not 63.5%, urgency is 59.5%, incontinence 56.8% urinary exertion, urinary urgency is 43.2%, frequent urination in one urination accounts for 36.5%, self-exuded urine without feeling urinating 28.4%. Thus, it can be seen that the condition of urination is very diverse and clinical types. This research result is higher than that of Ho Nguyen Tien et al., The rate of accompanying genital prolapse accounts for only 28%, the life with urinary disorders accounts for 30% but the incidence of urinary incontinence It was also assumed that 100% of the patients were hospitalized on the basis of incontinence, in which level 1 was 12%, level 2 was 52% and level 3 was 36% [3].

Evaluation of the incidence of urination in our study showed that among the patients with urination, 100% of the patients had urination on exertion, 58.1% had urgent and coordinated urination. There were 22.6% of patients had urinary incontinence during intercourse, 19.4% urinary incontinence associated with feces and 29% urinary incontinence accompanied by inactive feces. Our research is consistent with local authors such as Nguyen Thi Tan Sinh [9], Nguyen Thi Thanh Tam [6] and Nguyen Thi Ngoc Phuong [8] but higher than those of Nguyen Tan Cuong [4]

Table 4. Distribution of patients by reason of admission (n = 74)

Reason for admission	**Number**	**Percentage (%)**
Urination	74	100,0
Genital prolapse	71	96,0
Genital prolapse 1	56	78,9
Genital prolapse 2	5	7,0
Genital prolapse 3	10	14,1
Rectal prolapse	0	0,0
Cervical prolapse	19	25,7
Vaginal prolapse	66	89,2

Number of people admitted to the hospital with the reason of urination accounted for 100.0%, genital prolapse accounted for 96.0% (78.9% suffered from grade 1, 7% of grade 2 and 14.1% of grade 3), prolapse cervix accounts for 25.7%, prolapse into the vagina accounts for 89.2%. There are no cases of rectal prolapse. Our study is higher than that of author Ho Nguyen Tien, the rate of attached sex drive is 28% [3] and that of author Daher N. The rate associated with genital prolapse is 30% [5].

Table 5. Patient distribution by associated disease and some risk factors (n = 74)

Diseases	**No**	**Per (%)**
Urinary tract infections	50	67,6
Cystitis	21	28,4
Trauma to the genital area (cesarean section)	7	9,5
Constipation	36	48,7
Hemorrhoids	10	13,5
Menopause	20	27,0
Heavy work	60	81,1
Stress	60	81,1

The number of people who ever had urinary tract infection accounted for 67.6%, cystitis accounted for 28.4%, genital trauma accounted for 9.5%, constipation accounted for 48.7%, combined hemorrhoids accounted for 13.5 %, hard work accounted for 81.1%, stress in life 81.1%.

Table 6. Distribution of patients by degree of incontinence upon examination (n = 74)

Urinary incidence	**Number**	**Percentage**
Urinary incidence during examination		
Wet panties (grade 1)	67	90,5
Wet outer pants (grade 2)	7	9,5
Time to urinate		
Several times a year	15	20.2
Several times/month	54	73
Several times a week	5	6.8

100% of the patients had urination, including 67 cases of wet urine incontinence accounted for 90.5% and wet pants with 7 cases accounted for 9.5%. There are 20.2% of patients have urination annually, 73% have several times a month to urinate and 6.8% urinate several times a week.

Table 7. Distribution of study subjects according to BMI and urination status (n = 74)

BMI	**Exertion**		**Urgent**		**Total**	
	n	**%**	**n**	**%**	**n**	**%**
< 18,5	4	9,5	4	12,5	8	10,8
18,5 - 22,9	26	61,9	21	65,6	47	63,5
≥ 23	12	28,6	7	21,9	19	25,7

Among patients with incontinence, 10.8% were considered thin, 63.5% normal for BMI, and 25.7% were obese. In terms of exertion and urgency of urinary incontinence at BMI, levels were not statistically significant with p> 0.05. Compared to the results of Nguyen Thi Tan Sinh [9], there is a relationship between body mass index ≥22 and urination status. The risk of having urinary incontinence in people with BMI ≥ 22 is higher than those with BMI <22 with OR = 1.77, 95% CI: 1.31 - 2.4). Our results also showed a gradual increase in urination incidence with an increase in BMI. Our results are also consistent with the authors Ho Nguyen Tien with a BMI ≥ 23 of 32% [3].

Table 8. Evaluation of patients through diagnostic tests (n = 74)

Diagnostic test	**Number**	**Per (%)**
Valsava test (positive)	73	98,7
Cough test (positive)	73	98,7
Test Bonney (negative)	2	2,7
The amount of urine remaining after urinating ≥ 100 - 150 ml > 150 ml	132,6 ± 19,5 65 9	(100 - 170) 87,8 12,2
The amount of urine remaining after urinating General Minor incontinence Moderate incontinence	 132.6 ± 19.4 132.4 ± 19.5 134.3 ± 19.9	 P-value = 0,808

98.7% of the patients who tested Valsalva and cough tests were positive and 2.7% of Bonney tests were negative. Our results are also consistent with studies of domestic authors [6], [9], [10]. primary) before surgery was> 100 ml of which 65 cases accounted for 87.8% and urine residues> 150 ml had 9 cases accounting for 12.2%. The average residual urine volume of all patients was 132.6 ± 19.5 ml of which the lowest was 100 ml and the largest was 170 ml. There was no difference in the average amount of residual urine by urinary incidence. Our findings are also consistent with authors such as Nguyen Tan Cuong [4] and Le Si Trung [10].

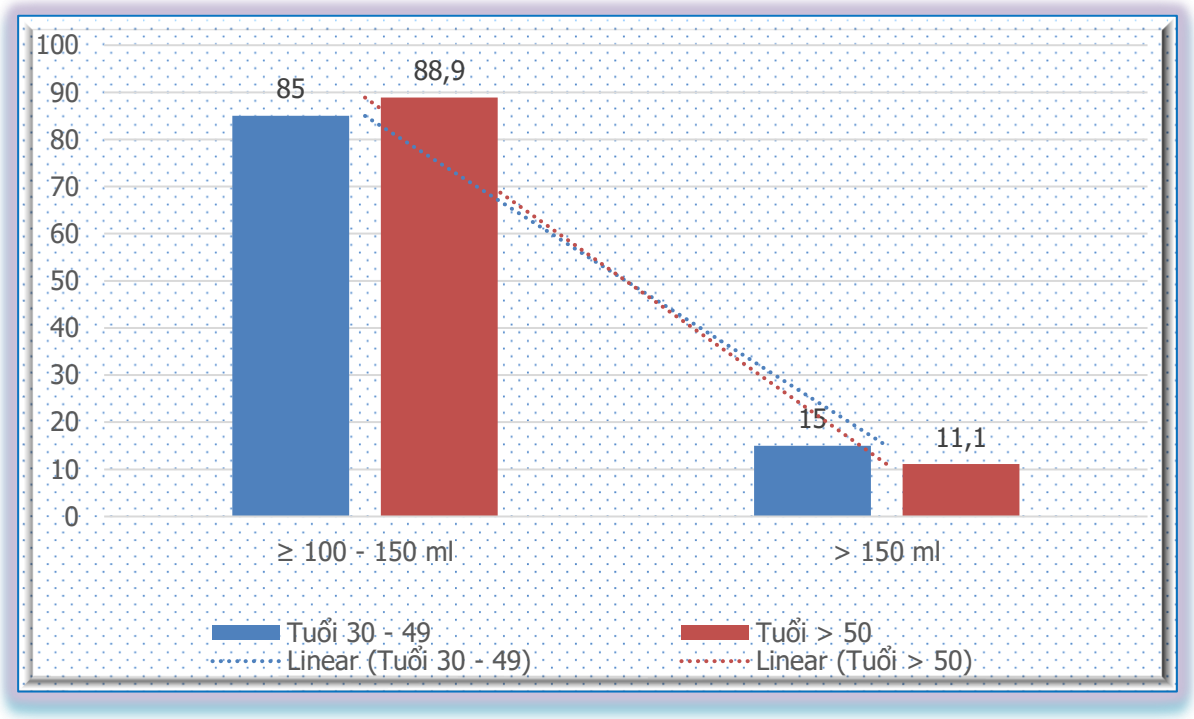

Figure 1. Relationship between age and residual urine (n = 74)

There was no statistically significant difference in the proportion of urine residues by level between the age groups of 30 - 49 years old and over 50 years old) and p> 0.05 (Fisher's exact = 0.696). Specifically: in the group of 30 - 49 years old, 85% of patients have urine output <150 ml while in the age group> 50 is 88.9%. Similar to the assessment of the amount of residual urine> 150ml, in the age group of 30-49, there is 15% while in the age group> 50, it is 11.1%.

Table 9. Some biochemical indicators by degree of urination

Indicators	Grade 1	Grade 2	p-values
RBC	4,5 ± 0,4	4,5 ± 0,2	0,61[a]
WBC	7,9 ± 6,5	6,7 ± 1,4	0,64[b]
PLT	272.3 ± 51.3	268.1 ± 86.9	0.85[b]
Hemoglobin	130.5 ± 7.7	130.6 ± 7.5	0.98[a]
Ure	4.6 ± 1.3	5. ± 1.5	0.4[b]
Creatinin	66.2 ± 13.3	73.7 ± 9.2	0.11[b]
SGOT	25 ± 9.6	23.9 ± 4.8	0.83[b]
SGPT	24.2 ± 14.1	26.1 ± 4.9	0.48[b]

a. T-student test b. Mann - Whitney U test

The table above shows that there is no difference in biochemical indices according to the level of urination with p> 0.05.

IV.CONCLUSION

Patients with urination (100%) or associated with dysuria (80.7%), or genital prolapse (96.8%). Patients with associated urination have urination disorders such as exertion during urination, urgency (urination) (58.1%), or a combination. Patients with urinary incontinence accompanied by urination disorders such as concomitant bowel movements (19.4%), accompanied by inactive bowel movements (29%). When examining the condition of the muscles of the bladder, urethra: positive Valsalva tests; positive cough test (100%). The amount of residual urine measured by catheterization > 100 ml, and the feeling of wanting to urinate but difficult to urinate. (100%). Maternity status, number of pregnancies, number of births, heaviest birth weight and method of delivery are factors that influence the indications for TOT surgery.

REFERENCES

1. **Hannestad Y. S.et al** (2000), "A community-based epidemiological survey of female urinary incontinence:the Norwegian EPINCOMT study. Epidemiology of Incontinence in the country of Nord - Trondelag", *J Clin Epideniol* **53**: 1150-57
2. **Honna Y. et al** (2002), "Urodynamics", In: Incontinence 2nd ed, Plymouth, UK: Plymouth Distributors
3. **Hồ Nguyễn Tiến, Lê Sỹ Phương, Bạch Cẩm An, Phan Viết Lâm** (2010), "Kết quả điều trị són tiểu khi gắng sức bằng phẫu thuật đặt Bandelette dưới niệu đạo", *Tạp chí Y học TP. Hồ Chí Minh,* Số 5 - tr.32 - 38.
4. **Nguyễn Tân Cương, Từ Thành Trí Dũng, Trần Lê Linh Phương, Vũ Hồng Thịnh, Nguyễn Hoàng Đức** (2009), "Đánh giá kết quả ban đầu điều trị tiểu không kiểm soát ở phụ nữ bằng nâng niệu đạo kiểu TVT", *Tạp chí Y học TP. Hồ Chí Minh,* Số 13 -tr.205 - 209.
5. **Daher N., Gagneur O., Gondry J., Mention J.-E., Merviel P., Boulanger J.-C.** (2005). TVT prépubien. Étude prospective longitudinale dans le traitement de l'incontinence urinaire d'effort de la femme: à propos de 164 cas. Gynécologie Obstétrique & Fertilité, 33: 570-576.
6. **NguyễnThị Thanh Tâm**(2008) "Nghiêncứutỷlệsóntiểu ở phụ nữ mãn kinh tại bệnh viện Phụ sản Từ Dũ". *Tạp chí Y dược học TP. Hồ Chí Minh, số 3*
7. **Davis G.et al** (1999), "Urinary incontinence among female soldiers", *Military Medicine* **164**(9):182 - 187.
8. **NguyễnThị Ngọc Phượng** (1998), "Nghiên cứu tình hình rối loạn tiểu tiện ở phụ nữ trước và sau mãn kinh". *Tạp chí thực hành số 5*
9. 9.**NguyễnthịTân Sinh (2007)** "Nghiên cứu thực trạng són tiểu và một số yếu tố liên quan ở nữ nhân viên BV Bạch Mai. Luận văn BS chuyên khoa cấp II. Đại học Y khoa Hà Nội năm 2007.
10. **Lê Sĩ Trung** (2006), "Điều trị són tiểu ở phụnữbằngphươngpháp T.O.T: kinhnghiệm ban đầu qua 15 trường hợp", *Y họcViệt Nam* 326: 1-6.

KNOWLEDGE, ATTITUDES AND PRACTICES ON REHABILITATION OF CAREGIVERS FOR PATIENTS WITH STROKE IN REHABILITATION DEPARTMENT OF THAI NGUYEN NATIONAL HOSPITAL

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ABSTRACT

Aims: This study is to evaluate the knowledge, attitudes and practiceson rehabilitation of caregivers for patients with stroke in Rehabilitation Department of Thai Nguyen National Hospital.

Subjects and methods: A cross-sectional study was conducted on 210 peoplecaring for patients with stroke in Rehabilitation Department of Thai Nguyen National Hospital.

Results: The common age in the age group of 40-60 accounted for 60.91%, and women were higher, making up 70.91%. Regarding knowledge, the percentage of caregivers with knowledge of the causes of brain stroke was 79.09%, with knowledge of measures to prevent a recurrent stroke was from 88.18 - 92.73%, with knowledge of caring for stroke patients was from 89.09 - 92.73%. Regarding the attitudes, up to 89.09% people thought that rehabilitation after brain stroke is necessary; 70.91% found it necessary to have the support of medical staff, 51.84% found it necessary to proceed immediately after a stroke. Regarding practical skills: Caregivers know how to facilitate the patients to lie, sit, stand and walk properly, accounting for 70.91% ;correctly performing motor exercises for paralyzed limbs accounted for 80.91%, for the paralyzed hand functions was higher, accounting for 82.71%.

Conclusion: **T**he knowledge, attitudes and practiceson rehabilitation of caregivers for patients with stroke in Rehabilitation Department of Thai Nguyen National Hospital were quite good.

Key words: *knowledge, attitude, practice, caregivers, stroke patient, rehabilitation.*

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I. INTRODUCTION

The Stroke is a common disease in the elderly. There are various causes of this disease, which can be fatal or leave a lot of severe metagenetic evidence especially movement. It is a burden not only for the sick, the family, but also to influence both the community and their nation [1], [5]. In the treatment of cerebral vascular accident, the problem sets not only prolong the life, but must improve the quality of life. In addition to physical, mental training, the patient also has to worry about protecting health against illness. In which the backup and recovery abilities of the sick are very much dependent on the knowledge, attitudes, care practices of the person taking care of the patient in the period of patient hospitalization and after discharge.The word will minimize the risk of death and subsequent severe complications after the Stroke [4], [2]. Therefore, to assess the understanding of the patient's relatives, at the same time to improve the quality of care,

prevention in the community, we conduct research topics to target.

Describes the current status of knowledge, attitudes and practices in support rehabilitation for patients with stroke of home care patients at the RehabilitationDepartment inThai Nguyen National Hospital.

2. METHODS

***TheSubject of research:**

In total 92 patients with strokeat the Department of Rehabilitation in Thai Nguyen National Hospital, we selected 110 people, who take care of patients being treated,standards of research during the period from January to March 10/2019 1/2019

***The standard selection**

- Patients over 18 years old

- Patients who selected the guarantee was diagnosed according to the criteria of the stroke

- Selection of patients who are taking care of patients and present at the time of conducting scientific research collects data

- For each patient, it is possible to interview up to 02 people who care for that patient

- If the patient has three or more caring relatives, choose relatives who have close relations and have time to take care of the patient

- The patient agrees voluntarily, cooperate in the research

* Exclusion criteria:

- The patient's family does not agree to participate in

- The patients who have problems tamly

- The patients who have hearing impairments, vision and languages

- Family members not directly involved in patient care frequently (<3 times / week)

* Research design

Cross-sectional descriptive study

*Research targets

- Age, sex, occupation, education, relationships with patients

- The percentage of caregivers who have knowledge of rehabilitation and relapse prevention for patients following brain stroke

- Proportion of carers have the right attitude about the rehabilitation of patients after cerebral stroke.

- The rate of caregivers has the skills to practice rehabilitation exercises for patients following brain stroke.

* Data collection techniques: Figures collected according to the uniform sample of the case through the interview questionnaire.

* Materials research:

- The interview questions.

- Research specimens

- Blood pressure monitor, timer circuit, pen.

*Methods of data processing

Data are input Epidata 3.1 software and is processed by algorithms medical statistics on SPSS 21.0

3. RESULT

Table 1: General characteristics of research group

Characteristics		n= 110	
		n	%
Age	18 – 40	30	27,27
	40 – 60	67	60,91
	> 60	13	11,82
Sex	Male	32	29,09
	Female	78	70,91
Education level	University/ Postgraduate degree	25	22,73
	Colleges	27	24,55
	High school	57	51,82
	Primary school/ Illiterate	1	0,91
Accommodation	City	41	37,27
	Country	69	62,73
Career	Retirement	13	11,82
	Officers	35	31,82
	Students, pupils	6	5,45
	Farmer,	56	50,91
Relationship	Spouse or child	67	60,91
	Sibling	24	21,82
	Maid	19	17,27

Comment: Age of common in the age group 40-60 accounted for 60.91%, female accounts for 70.91%, the level of education mainly learned the full spectrum accounted for 51.82%, the current property is predominantly rural occupied 62.73%, the status of career officials took over 31.82% , relations with patients mainly spouses or descendants accounted for 60.91%.

Table 2: The knowlegde of the causes of the stroke

The knowlegde of the causes of the stroke	n	(%)
Hemorrhagic stroke	19	17,27
Ischemic stroke	15	13,64
Both	53	48,18
Không biết	23	20,91
Do not know	110	100,00

Comment: The proportion of subjects selected embodiments fairly evenly. Overall research subjects understand a part of the causes of the stroke. Highest rate right choice both occupy 48.18% 2 option, besides, proportion of subjects did not know about the classification of causes of the stroke still big with 20.91%.

Table 3: The knowlegde of preventive measures the stroke recurrence

The knowlegde of preventive measures the stroke recurrence	n	%
Do excercises regularly	98	89,09
Diet in moderation	102	92,73
Periodic medical examination, taking prescription	74	67,27
Comfortable	97	88,18
Do not use alcohol, smoking	68	61,82
Take the pill by themself	8	7,27

Comment: The caregiver knows the diet has an important role to avoid recurrent accidents that account for 92.73%, knowing that comfort is psychological to avoid anxiety 88.18%.

Table 4: The knowlegde of take care of patients

The knowlegde of take care of patients	n	%
Knowing the principles set position for patient treatment	98	89,09
Know how oral care tongue	102	92,73
Changing positions 2 hours / time	74	67,27
Period of rehabilitation	97	88,18
Knowing the bad posture cause secondary injuries, make the patient worse	68	61,82
Know the symptoms of abnormal expression levels of defense heavier	8	7,27

Comment: Caregivers patient postures known principles set 89.09% therapy, said oral care, tongue 92.73%, said time should conduct rehabilitation 88.18%.

Table 5: Attitudes about the rehabilitation of the study subjects

Attitudes	Agrees		Not agrees		No comment	
	n	%	n	%	n	%
Rehabilitation method is needing	98	89,09	10	9,09	2	1,82
Nurse support	78	70,91	29	26,36	3	2,73
Rehabilitation should be conducted immediately after strokes	57	51,82	48	43,64	5	4,55
Attention should be given to other injuries caused not only by paresis	75	68,18	32	29,09	3	2,73
Patients should encourage themselves to actively	81	73,64	27	24,55	2	1,82
Descending the engine assistance when increased capacity	77	70,00	27	24,55	6	5,45

Comment: 89.09% results for that rehabilitation after brain stroke are needed; 70.91% shows need the support of the medical staff, 51.84% find it necessary to carry out immediately after being stroke.

Table 6: Practice on rehabilitation of the study subjects

Options	Proper practice		Wrong practice		Do not perform	
	n	%	n	%	n	%
Facilitate patient posture in bed, when the throne, standing, walking	78	70,91	20	18,18	12	10,91
Collective mobilization, massage joints paralyzed limbs party	89	80,91	15	13,64	6	5,455
Tap the paralyzed hand function	91	82,73	11	10	8	7,273
Postural changes in patients 2hours /time	79	71,82	30	27,27	1	0,909
Oral care, tongue, mouth exercises	65	59,09	30	27,27	15	13,64
Vibratory Cage Vibration for patients	57	51,82	16	14,55	37	33,64

Comment*:* Caregivers know to facilitate the patients know lying, sitting, standing and walking properly accounted for 70.91%, accounting for 18.18% done wrong. Done properly mobilizing paralyzed limbs accounted for 80.91% side, set the function hand side accounted for 82.71% paralysis.

IV. DISCUSSION

5.1. About general characteristics

Common age in the age group 40-60 accounted for 60.91%, accounting for 70.91% female gender, level of education was mainly secondary school accounted for 51.82%, it currently occupies mainly rural 62.73%, occupational status civil servants accounted for 31.82%, the relationship with patients mainly spouses or descendants accounted for 60.91% gut. These characteristics can be explained by the women, they carefully, meticulously attentive and capable patient care better than men, and those men are breadwinners should priority job to spend time caring for family income. Besides, there may be due to the rural women mostly have cultural level is not high, they do not have a stable job, so when the family has relatives was stroke, they will be sent to patient care.

5.2. Discuss about knowledge, attitude, practice of caregivers

* About knowledge:

- Knowledge of the causes of stroke: The proportion of subjects selected embodiments fairly evenly. Overall research subjects understand part of the causes of stroke. Highest rate right choice both occupy 48.18% 2 option, besides, proportion of subjects did not know about the classification of causes of large stroke with 20.91% still showed ratio .The research shows people care and assisting farmers to 50.91% proportion so that knowledge of causes of stroke selection is unknown proportion 20.91%.

- Knowledge of preventive measures stroke recurrence: Caregivers said patients

diet have an important role to avoid accidents accounted for 92.73% of recurrence, should know the psychological hold comfortably avoid anxiety 88.18%.

- Knowledge of stroke patient care: The patient care know that the principles set therapy 89.09% investment, said oral care, tongue 92.73%, said time should proceed with rehabilitation 88.18% performance.

In Nhan Dan Hospital, The research by Nguyen Thi Thanh Tinh in 2014 showed that the rate study subjects with knowledge of rehabilitation is 42.7%, correct knowledge about the process of recovery after stroke is brain 43.3%, knowledge of stroke warning signs of the brain, the patients know the symptoms of low cerebral stroke 55.3% only [3].

* About attitudes:

89.09% results for that rehabilitation after brain stroke are needed; 70.91% think that the need to have the support of the medical staff, 51.84% find it necessary to proceed immediately after the catastrophe. In the study by Nguyen Thi Thanh Tinh proportion of patients with good attitude about the advantages of brain stroke prevention 54.7% occupied and good attitude about the difficulties of implementing the prevention of secondary brain stroke accounted 98%.

* About practice:

Caregivers know to facilitate the patients know lying, sitting, standing and walking properly accounted for 70.91%, accounting for 18.18% done wrong. Done properly mobilizing paralyzed limbs accounted for 80.91% side, set the function hand side accounted for 82.71% paralysis.

V. CONCLUSIONS

Knowledge, attitude and practice of rehabilitation of people care for patients with stroke at the Department of Rehabilitation in Thai Nguyen National Hospital is pretty good.

REFERENCES

1. **Dang The Chan Le Duc Hinh (2012),** "Death from stroke, Bach Mai Hospital", summary record of neuroscience research work, Medical Publishing House, pp.94-100.
2. **Nguyen Thi Nhu Mai (2014),** The need for care, rehabilitation and some factors related to the degree of independence in daily life of patients with stroke after discharge at the old hospital Central Faculty 2013, Master's thesis in Medicine, University of Public Health.
3. **Le Van Tuan Nguyen Thi Thanh Tinh, Norwood Susan (2014),** "Knowledge and attitude of patients in the prevention of secondary cerebrovascular accident", Journal of Medical Research City. Ho Chi Minh, 18 (2).
4. **Sanjana Tallihalla Rajegowda, Veena Jasmine Pinto and Peter George (2017),** "Study on stroke awareness among caregivers of stroke patients", International Journal of Biomedical Research 2017; 8 (08): 484-487.
5. **Lee KW, Choi SJ, Kim SB, Lee JH, Lee SJ (2015),** "A Survey of Caregivers' Knowledge About Caring for Stroke Patients", Ann Rehabil Med. 2015 Oct; 39 (5): 800–815.

INTERVENTIONAL RESULTS OF SWALLOWING EXERCISES ON STROKE PATIENTS WITH SWALLOWING DISORDER IN THE REHABILITATION DEPARTMENT OF THAI NGUYEN NATIONAL HOSPITAL

Nguyen Phuong Sinh*, Vu Thi Tam*, Tran Thi Lien*

ABTRACT

Objective: To evaluate the interventional results of swallowing excercises on stroke patients with dysphagia disorders within a month at the Rehabilitaion Department of Thai Nguyen National Hospotal.

Subjects and Methods: A comparative pre- and post-intervention study was conducted on 57 stroke patients with swallowing disorders intervened by swallowing exercises for 1 month.

Results: Before the intervention: The rate of stroke patients with swallowing disorder accounted for 61.95% (57/92). Among them, the patients with mild swallowing disorders accounted for the highest proportion (68.42%), followed by the moderate swallowing disorders (19.30%) and severe swallowing disorders (12.28%). ; The rate of patients being able to cough strongly and clearly was 5.26%, 12.28% was not able to cough when required; the percentage of patients controlling their saliva well was 5.26%, unable to control their saliva was 12.8%. After the intervention, 35.09% of the patients no longer had swallowing disorder; the proportion of patients being able to cough strongly and clearly was 22.81%; only 1.75% of patients could not cough as required; 40.35 % of patients had good control of their saliva; only 1.75% of patients could not control their saliva. The improvement in swallowing function is statistically significant with p <0.05.

Conclusion: The swallowing exercises have good results for stroke patients with swallowing disorders to ensure swallowing safety for patients. Stroke patients should be clinically screened for early detection of swallowing disorders in order to receive early and timely intervention.

Key words**:** *Stroke, swallowing disorders, swallowing exercises, GUSS (the Gugging Swallowing Screen)*

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I. INTRODUCTION

Swallowing disorder is a common problem among patients with acute cerebrovascular stroke, accounting for 42-67% [5] that causes choking inhalation leading to pneumonia at up to 73.4%. Early detection of swallowing disorders not only reduces the risk of pneumonia but also reduces the risk of malnutrition, hospitalization and mortality. Therefore, the early diagnosis and treatment of swallowing disorders among acute stroke patients have been considered one of the measures to reduce the complications as well as death.

The Gugging Swallowing Screen (GUSS) is a fast, easy, reliable method for determining patients with swallowing disorders and choking hazards. The scoring system breaks down swallowing disorders into different levels with proper recommendations given on nutrition. In

Vietnam, there have not been many researches into swallowing disorders among patients with stroke, as well as evaluating the role of early clinical detection of swallowing disorders, and evaluating the effectiveness of swallowing intervention exercises. That was why we conducted this topic to: *Assess the effectiveness of swallowing exercises among patients with swallowing disorders 1 month after intervention.*

II. METHODS

2.1. Subjects:

57 stroke patients who had swallowing disorders and met study criteria were selected from screening 92 patients admitted to the Rehabilitation Department of Thai Nguyen National Hospital from 1/2019 - 10/2019.

**Selection criteria:*

+ The diagnosis of stroke is based on the standards of the World Health Organization.

+ The patients are conscious and cooperative.

**Exclusion criteria:*

- Patients with consciousness disorders cannot perform the test.

- Stroke patients are on mechanical ventilation.

- Patients with swallowing disorders due to other causes

- Patients do not agree to participate in the study.

2.2. Methods

* Research design: Pre-Post-intervention comparative study

* Selecing sample method: convenient sample selection. Patients with stroke who are identified as having swallowing disorders will be given intervention swallowing exercises instructed by medical staff.

* Intervention techniques: The patients were intervened with the following techniques: posture change techniques, sensory awareness-raising techniques, motor exercises including oral movements, tongue movements, pronunciation exercises, exercises to clean the throat and reduce the backlog of the mouth (swallowing excercises, practice pushing the jaw, practice strengthening the muscles to support swallowing, practice swallowing with swallowing stimulants ...).

2.3. Research Targets

- The rate of swallowing disorders: assessing swallowing according to the swallowing screening scale - Gugging Swallowing Screen (GUSS). Patients were all 3 kinds of food (viscous, watery and hard) to swallow. Before and during the process of swallowing food, the patients were equipped with a SPO2 meter to detect respiratory failure (if any) for timely emergency. The patients with GUSS $\leq$ 19 points were diagnosed with swallowing disorders.

- Grading of swallowing disorders: *Mild* with GUSS from 15-19 points*; Moderate* from 10 to 14 points; *Severe* with GUSS $\leq$ 9 points.

- The effectiveness of swallowing exercises:

+ Improvement in scores of GUSS

+ Improvement in the backlog of the mouth

+ Improvement in coughing condition.

+ Improvement in ability to control saliva.

2.4. Data collection techniques

- Sample medical records

- Hospital records

- Gugging Swallowing Screen (GUSS)

2.5. Data processing methods

Data were entered by using Epidata 3.1 software, analyzed and processed by using medical statistical algorithms and using SPSS 21.0 software.

2.6. Ethical research issues

- The study was approved by the Medical Ethics Council of the University of Medicine and Pharmacy, Thai Nguyen University.

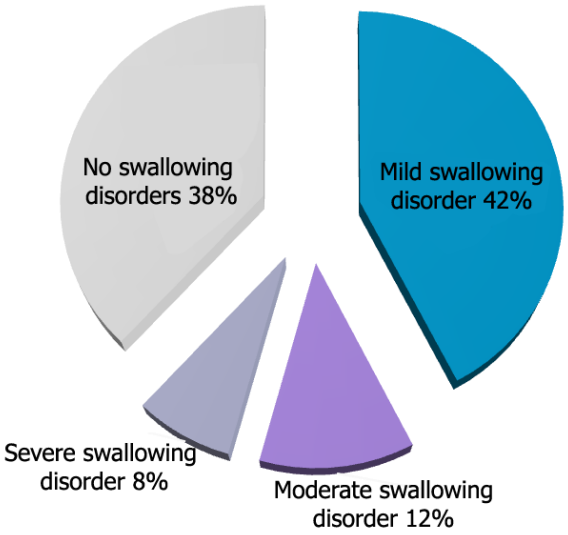
- The patients have the right to refuse to participate in the study at any time during the research process.

- Data are used for research purposes, not for any other purposes. Personal information of participants will be kept confidential.

III. RESULTS AND DISCUSSION

A study on 92 patients with stroke at the Rehabilitation Department - Thai Nguyen National Hospital between January 2019 and October 2019 found 57 patients with swallowing disorders accounting for 61.95%.

3.1. The rate and grade of swallowing disorders



Comments:

- The rate of stroke patients with swallowing disorder (61.95%) accounted for the majority.

- The highest rate of mild swallowing disorder (42%) was followed by the rate of moderate swallowing disorder (12%) and severe swallowing disorder (8%).

3.2. Evaluating the effectiveness of swallowing exercises in patients with swallowing disorders 1 month after the intervention.

Table 1: The improvement of intervention by swallowing exercises through the assessment by GUSS scale

GUSS scoring scale	Before the intervention		After the intervention		p
	n	%	N	%	
Mild	39	68,42	30	52,63	<0,001
Moderate	11	19,3	5	8,77	
Severe	7	12,28	2	3,51	
No swallowing disorders	0	0	20	35,09	
	57	100	57	100	

Comments: Before the intervention it can be seen that the highest rate of the patients with mild swallowing disorders accounted for 42%. After the intervention, 35,09% of the patients no longer had swallowing disorders.

Table 2: The improvement in coughing symptoms in patients as required to make strong coughs

Coughing symptoms	**Before the intervention**		**After the intervention**		p
	n	%	N	%	
Nothing abnormal detected on examination; patients made strong and clear coughs.	3	5,26	13	22,81	<0,001
Effective but slow, husky coughs	25	43,86	27	47,37	
Ineffective coughs	22	38,60	16	28,07	
Inability to cough	7	12,28	1	1,75	
	57	100	57	100	

****Comments:*** Before the intervention, it can be seen that the rate of the stroke patients without abnormality found on examination and patients being able to make strong coughs only accounted for 5.26%. However, after the intervention the rate of patients being able to make strong coughs was 22.8%; only 1.75% of them could not cough as required.

Table 3: The improvement in the patients' ability to control their saliva

Ability to control saliva	**Before the intervention**		**After the intervention**		p
	n	%	n	%	
No drooling	3	5,26	23	40,35	<0,05
There is saliva at the corners of the mouth	6	10,53	10	17,54	
Sometimes drooling, when speaking while lying on your side, when tired.	24	42,11	22	38,60	
There is always a little salivation.	17	29,82	1	1,75	
Clear drooling, inability to control saliva, gaping mouth, need to wear bibs.	7	12,28	1	1,75	
	57	100	57	100	

****Comments:*** Before intervention the rate of the patients with excessive salivation needing to wear bibs accounted for 12.28%. After the intervention, only 1 patient accounting for 1.75% had to wear a bib.

Table 4: Food backlog in the oral cavity before and after the intervention

Food backlog in the oral cavity	**Before the intervention**		**After the intervention**		p
	n	%	n	%	
No food backlogged in the mouth	5	8,77	19,00	33,33	<0,05
A little food backlogged in the mouth	15	26,32	28,00	49,12	
A lot of food backlogged in the mouth	37	64,91	10,00	17,54	
Tổng	**57**	**100,00**	**57,00**	**100,00**	

***Comments:** Before the intervention the situation of food left in the oral cavity occurred in the high rate of 91.23% of the patients. After the intervention, this figure decreased to 66.66%, especially the rate of the patients with a lot of food backlogged decreased significantly from 64.91 % (before the intervention) down to 17.54% (after the intervention).

IV. DISCUSSION

4.1. About the rate of stroke patients with swallowing disorders

- The research results showed that the rate of swallowing disorder (61.95%) accounts for the majority. The highest rate of mild swallowing disorder (42%) was followed by the rate of moderate swallowing disorder (12%) and severe swallowing disorder (8%). This result is consistent with the results of some other authors showing that the rate of swallowing disorder fluctuates in the range of 40 - 81% of which the highest swallowing disorder rate is determined in the acute phase.

Our research results are similar with author Nguyen Thi Phuong Nga (2014) that the rate of swallowing disorder is 60.7% (54 patients). In particular, the rate of mild swallowing disorder was 15.7%, of moderate was 7.9%, and of severe was 37.1% [3]. This rate is equivalent to the swallowing disorder rate of the author Ma Le Quan (57.63%) using the same method of assessment by the GUSS scale. Studies of other authors with different evaluation methods showed the rate of swallowing disorders in stroke patients was 30% - 67% [1, 4].

Thus, the overall rate of swallowing disorder in patients after stroke being treated at the Rehabilitation Department is relatively high, so it is necessary to have a detailed assessment of swallowing disorder at this stage by language experts and rehabilitation interventions in a timely manner to reduce complications, to make prognosis of treatment and to improve quality of life of stroke patients.

4.2. The effectiveness of swallowing exercises in stroke patients with swallowing disorders 1 month after intervention.

- When using GUSS scale to evaluate the swallowing disorder we saw, before the intervention, the highest rate of mild swallowing disorder was 42%. After the intervention 35.09% of patients no long had

swallowing disorders . The difference is statistically significant.

- On the improvement of coughing symptoms when asking patients for a strong cough, it showed that, before the intervention, the rate of patients without abnormalities on examination and patients who could made strong coughs was only 5.26%, but after the intervention, the proportion of patients with who could make strong cough was 22.81%; only 1.75% of patients could not cough as required.

- Regarding the improvement of saliva control ability, it showed that before the intervention the patients drooling a lot and needing to wear bibs accounted for 12.28%. After the intervention, only 1 patient accounting for 1.75% had to wear a bib.

- Regarding the improvement of food backlog in the mouth, the proportion of the patients with no food left before the intervention was only 8.77%. After the intervention, the rate of the patients without food left in the mouth accounted for 33.33%

Our research results are similar to those of author Tran Minh Tuan (2016) showing the improvement in the ability to cough, swallow liquid when conducting interventions by swallowing rehabilitation exercises for stroke patients. [2]

V. CONCLUSIONS

- The rate of swallowing disorders was 61.95%

- The highest rate of mild swallowing disorder (42%) was followed by the rate of moderate swallowing disorder (12%) and severe swallowing disorder (8%).

- There was an improvement in coughing symptoms when patients were asked to cough strongly after the intervention.

- There was an improvement of saliva control ability.

- There was an improvement in the backlog of food in the mouth.

REFERENCE

1. **Nguyễn Thị Dung (2014).** Preliminary study of swallowing disorders and the need for rehabilitation intervention in patients with stroke, Resident's Dissertation, Hanoi Medical University.
2. **Trần Văn Tuấn Lê Thị Mai (2011),** "Studying clinical characteristics and assessing the effectiveness of swallowing exercises in patients with trophic disorders after stroke". Journal of Science and Technology, Volume 89 (February 1), pp. 59-63.
3. **Phan Nhựt Trí, Phạm Thắng, (2011)**,"Screening for swallowing disorders using GUSS in patients with acute stroke in Ca Mau Hospital in 2010", Practical Medicine Research, vol 74 (3), pp. 167-171.
4. **Bakhtiyari J, Sarraf P, Nakhostin-Ansari N, Tafakhori A (2015).** Effects of early intervention of swallowing therapy on recovery from dysphagia following stroke. Iran J Neurol. 2015 Jul 6;14(3):119-24.
5. **Baroni AFFB, Fabio SRC et al (2012).** Risk factors for swallowing dysfunction in stroke patients. Arq Gastroenterol v. 49 –no.2– abr./jun.
6. **Connor LT Edmiaston J (2010),** "Validation of a Dysphagia Screening Tool in Acute Stroke Patients. ", Am J Crit Care;19:357-364.
7. **Love CP (2001)** Perry L, "Screening for dysphagia and aspiration in acute stroke: a and Dysphagia systematic review", 16(1), pp. 7-18.