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Attitude of medical students to the evacuated blood collection system

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- Objective** : *To study the attitude of medical students to the evacuated blood collection system*
- Study Design** : *Descriptive cross-sectional study*
- Setting Design** : *Department of Laboratory Medicine, Faculty of Medicine, Chulalongkorn University*
- Subjects** : *Third-year medical students of the Department of Laboratory Medicine, Faculty of Medicine, Chulalongkorn University in academic year 1998*
- Method** : *Questionnaire survey*
- Results** : *34.7 % of the 98 subjects felt anxious about this technique. Of those who felt anxious in the 3 categorized groups (practitioners, recipients and observers), the percentage of observers was the highest. There was a significant relationship between experience and feeling anxious. 80.6 % of total subjects indicated that they would use this technique in the future. Most of the subjects did not give reasons for their decisions. There was no significant relationship between experience and a decision to use it. There was a significant relationship between feeling anxious and a decision to use this technique in the future.*

Conclusion : *Experience is very important in practicing medical procedures. Medical skill training programs are necessary in medical education. According to consumer behavior theory, a decision to use this technique was mainly according to emotional desire. Nowadays there are many new systems to provide the best techniques for both medical personnel and patients*

Key words : *Evacuated blood collection system, Attitude, Medical Student.*

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วิโรจน์ ไววานิชกิจ, อัครณาสัย ศิริตันติกกร. ทัศนคติของนิสิตแพทย์ต่อการเจาะเลือดด้วยระบบสุญญากาศ. จุฬาลงกรณ์เวชสาร 2542 ก.ค; 43(7): 475-83

วัตถุประสงค์ : เพื่อศึกษาทัศนคติ นิสิตแพทย์ต่อการเจาะเลือดด้วยระบบสุญญากาศ

รูปแบบการศึกษา : การศึกษาเชิงพรรณนาชนิดตัดขวาง

สถานที่ทำการศึกษา : ภาควิชาเวชศาสตร์ชั้นสูงตร คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

กลุ่มที่ทำการศึกษา : นิสิตแพทย์ชั้นปีที่ 3 ภาควิชาเวชศาสตร์ชั้นสูงตร คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ปีการศึกษา 2541

วิธีการศึกษา : การสำรวจโดยใช้แบบสอบถาม

ผลการศึกษา : 34.7 % ของกลุ่มที่ทำการศึกษาที่ความรู้สึกกังวลต่อการทำหัตถการชนิดนี้ เมื่อพิจารณาร้อยละของผู้ที่มีความรู้สึกกังวลจำแนกตามกลุ่มที่แบ่งตามประสบการณ์ทั้ง 3 กลุ่มคือ กลุ่มผู้ได้เจาะเลือด ผู้ที่ถูกเจาะเลือดและผู้สังเกตการณ์ พบว่าจำนวนร้อยละในกลุ่มผู้สังเกตการณ์สูงที่สุด มีความสัมพันธ์อย่างมีนัยสำคัญระหว่างความกังวลในการทำหัตถการกับประสบการณ์ 80.6 % ของกลุ่มที่ทำการศึกษาคัดสินใจจะใช้วิธีนี้ในอนาคต แต่ส่วนใหญ่มิได้ระบุสาเหตุในการเลือกใช้หรือไม่ใช้ ไม่พบความสัมพันธ์อย่างมีนัยสำคัญระหว่างประสบการณ์กับการตัดสินใจเลือกใช้ พบว่ามีนัยสำคัญระหว่างการตัดสินใจเลือกใช้วิธีการนี้กับความกังวลในการใช้วิธีนี้ในการทำหัตถการ

สรุป : ประสบการณ์มีส่วนสำคัญในการทำหัตถการทางการแพทย์ การฝึกทักษะการปฏิบัติงานเป็นสิ่งจำเป็นในทางแพทยศาสตร์ศึกษา ปัจจัยที่สำคัญต่อการตัดสินใจใช้วิธีการในการทำหัตถการ ขึ้นกับความต้องการทางด้านอารมณ์จิตใจเป็นหลักสอดคล้องตามทฤษฎีพฤติกรรมผู้บริโภค ในปัจจุบันได้มีการประยุกต์หลายประการของวิธีการนี้ เพื่อให้ได้ระบบที่มีประสิทธิภาพสูงสุด สำหรับทั้งบุคลากรทางการแพทย์และผู้ป่วย

Nowadays, the most common technique to obtain blood specimens is venipuncture⁽¹⁾ and it is an important procedure for diagnosis and treatment. There are many methods to perform a venipuncture procedure but the common methods are the syringe blood collection system and the evacuated blood collection system. The evacuated blood collection system uses basic principles of fluid mechanics and is a modern method that is used world-wide nowadays. A plastic holder, sterile specially - designed blood collection needle and a vacuum blood collection tube are used together as the system.⁽²⁻⁶⁾ In performing this technique, medical personnel should practice following recommendations and the universal precautions.⁽⁹⁾

Although the system is accepted for its advantages and is used in many medical centers, it is not well known in Thailand. In King Chulalongkorn Memorial Hospital this technique is now in limited use at the Out-Patient Clinic of the Laboratory Medicine Division, though this technique can be applied in every department. According to the policy aspects, medical procedures should be performed by well - trained medical personnel. This blood collection method is taught to medical students. But as this technique is not a familiar technique for medical personnel, the students' attitude to the technique is important.⁽¹⁰⁻¹¹⁾ Without a good attitude, people tend to not use a device, and even if they do use it, the results may not be good. Following this basic principle, the introduction of any new medical technology should be concerned with the how the users think about it.

In Thailand, there have been no reports about the attitude of medical students regarding this venipuncture technique. As pre-clinical year medical

students have to deal with medical procedures in the clinical year training and in their later real medical practice, their attitude to the medical procedures should be studied. Therefore, this study was conducted and the results can be used as basic data for improving this technique.

Methods and Materials

Third year, medical students of the Faculty of Medicine of Chulalongkorn University during academic year 1998 who did not mind replying to the questionnaires were included in this study. A self - administered questionnaire about their attitude to using the evacuated blood collection system procedure was sent to the subjects after the training class was completed. The questions used are shown in Diagram 1. All questions were explained to the students before they replied. All 2nd year medical students were excluded because the training course in venipuncture by this technique was given to 3rd year medical students. Descriptive statistical analysis was carried out on the data where it was appropriate. Chi-square test was used for comparison. $P = 0.05$ was accepted as significant level.

Results

There were 98 medical students included in this study. There were 43 males and 55 females.

The subjects were divided into three groups by their experience in the training class those who had practiced venipuncture as practitioners, those who had had venipuncture done as recipients and those who were observers. (22.4 % were practitioners, 21.4 % were recipients and 56.1 % were observers). None was in more than one group.

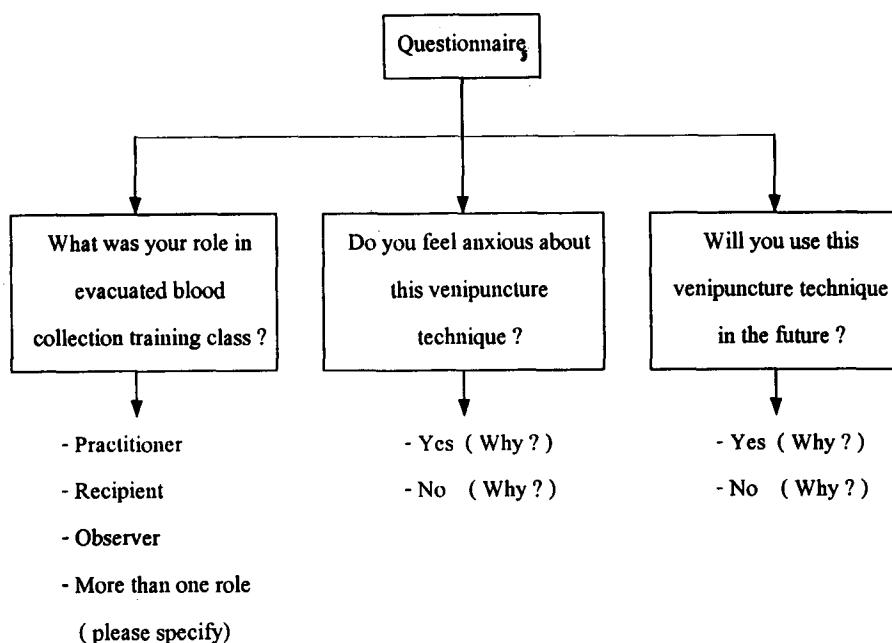


Diagram 1. Questions used in this study.

Thirty - five subjects (35.7 %) - 14 male and 21 female - indicated that they felt anxious about the technique and 63 subjects (64.3 %) - 29 male and 34 female - indicated that they did not. In cases of anxiety, they gave many reasons. Most who did not feel not anxious did not give reasons. (Table 1)

Table 1. Reasons for feeling anxious about evacuated blood collection system or not.

Group	Number of subjects
1. Feel anxious	
- not believe sterility of system	3
- fear pushing needle into vein	4
- fear collecting blood specimen	8
- fear pulling needle out	1
- no reason	19
2. Not feel anxious	
- believe sterility of system	1
- no reason	62

As for decisions to use this venipuncture technique in the future, 79 subjects (80.6 %) indicated that they would use it and 19 subjects (19.4 %) indicated that they would not. Most of them did not give reason why they would or would not use it. (Table 2)

Table 2. Reasons for decision to use evacuated blood collection system in the future or not.

Group	Number of subjects
1. Use	
- getting multiple samples from one venipuncture	1
- new technique	1
- no reason	77
2. Not use	
- thought that it is more painful than syringe technique	2
- difficult to use	2
- no reason	15

There was a significant relationship between the experience of the medical students and their feeling anxious or not, but there was no significant relationship between their experience and their decision to use this technique in the future or not (Table 3). There was a significant relationship between a decision to use this technique in the future and feeling anxious about it. (Table 4)

Discussion

There were a lot of students who felt anxious about using this technique. For those subjects who gave reasons why they felt anxious, the major reason was fear of improperly performing the blood collection step. A principle of the system is that the venous blood pressure pushes the blood through the needle and into the vacuum tube. Persons who use this

Table 3. Relation between experience of subjects and felling anxious / decision to use evacuated blood collect technique in the future.

	Practitioners	Recipients	Observers
A. Feeling anxious			
- Yes	6	3	26
- No	16	18	29
B. Decision to use this technique in the future			
- Yes	19	17	43
- No	3	4	12

A. $X^2_{\text{calculate}} > X^2_{0.052}$

B. $X^2_{\text{calculate}} < X^2_{0.052}$

Table 4. Relation between decision to use evacuated blood collection technique in the future and feeling anxious.

	Decide to use this technique in the future	Not decide to use this technique in the future
Feel anxious about this technique	20	15
Not feel anxious about this technique	59	4

$X^2_{\text{calculate}} < X^2_{0.052}$

technique, unlike the syringe blood collection system for which users can try aspiration, cannot see if they performed a correct puncture into the vein or not. So if the medical personnel using this technique are not well trained, the procedure will seem difficult and tend to fail. In this study, there were some students who did not believe in the safety of the system. But in fact, this is a closed-system, so if the equipment, patients and medical personnel are well prepared, there should be no problems about safety. All equipment in this system (holder, needle and vacuum tube) are sterile so if they are to contaminated, no infection should occur.⁽¹⁻⁹⁾

In this study, there was a significant relationship between the experience of the subjects and the feeling anxious. As expected, the valid percentage of subjects who felt anxious in the group of observers (47.3 %) was higher than in the other two groups (27.3 % for the practitioners and 14.3 % for the recipients). This may be due to the fact that the population in this study was medical students and their sense of when to perform a medical procedure is not yet developed. We believe that in general practice, if the medical personnel have never used this technique, they will feel anxiety at the first use but after several repetitions, they will feel comfortable and be smooth in practice. The data that revealed a higher percentage of feeling anxious in the observers group indicates the importance of practicing rather than observing. If the medical personnel donot get enough experience with a medical procedure, they may not feel comfortable in performing it. It usually takes several repetitions to get the full sense of performing a correct procedure. Feeling anxious in any medical procedures cannot

bring good results when practicing them.⁽¹²⁾ Therefore, procedure training in medical study is still an important topic in medical education. And we believe that if students do not practice, they will not acquire a no good attitude and proper knowledge .

A determination to use this technique in the future did not depend on the categorized groups. Most of the students did not give reasons for their decision. And when they gave reasons, there was no predominant reason. There was a significant relationship between a determination to use it and feeling anxious. This result follows the principle basic of users behavior in that the main reason for a consumer to use a service mainly depends on their emotional desire, not a reasonable desire.⁽⁹⁻¹⁰⁾ Thus how to improve this technique depends mainly on how to make the users feel comfortable with the procedure. And these days , many applications are developed to serve user's demands.⁽¹⁻⁸⁾ (Table 5). We found that there were some subjects who felt anxious about this technique but decided to use it in the future. If such students can be detected early, they can be given proper training and guidelines for require adequate the procedure. Decisions to use new technology require adequate knowledge and as discussed earlier, as knowledge increases. feeling of anxiety decreases.

This study was a cross-sectional study only. Therefore, no longitudinal information could be received, and it was limited to medical students only. Results from other groups of medical personnel might be different. Further study, as a longitudinal study, in a larger group of medical personnel is recommended.

Table 5. Applications of the evacuated blood collection system.

Topic	Detail
1. Safety aspect	<ul style="list-style-type: none"> - Single use disposable needle - Special holder such as holder with needle disposable button, needle with plastic coverage - Special high edge stopper of vacuum tube - Leur's adapter
2. Convenient aspect	<ul style="list-style-type: none"> - Various size of tube and needle - Ultra thin needle - Vacuum tube with gel separator - Vacuum tube for specific laboratory test such as ESR, coagulation, Microbiology - Specific stopper - Plastic vacuum tube
3. Social aspect	<ul style="list-style-type: none"> - Low cost equipment

As medical personnel and patients are the main users of any medical technology, study about their feelings and attitudes toward that technology is important for improving use of the technology. This study can be used as a pilot study for improving the use of this medical instrument technology.

From this study we also made some recommendations;-

- Medical procedure training is important. Medical personnel should receive adequate training in new technology in order to use it correctly and effectively. Any new procedure workshop should be attended by all levels of medical personnel.
- When medical personnel indicate anxiety about a medical procedure, they should receive a training program and guidelines for its use. Feeling anxious

or having other fear about a medical technology is important, because if a user is uncomfortable with a new technique, he will not do it well and failure is likely to occur.

- Providing for some instrument use in the medical laboratory or other specific sections. The hospital should be concerned not only about scientific topics but also humanistic topics
- Medical personnel tend seems to select technology following consumer behavior principles, so the technology should match this fact. Any instrument should be effective and satisfy users. The significant topic that should be considered is how to make the users (both medical personnel and patients) get the most benefit.

Conclusions

The evacuated blood collection system is a technique of venipuncture that should be better known. It is a safe and effective method of venipuncture. Like other types of services, use and acceptance, follows the principle of consumer behavior in that use of this techniques is mainly according to emotional acceptance. Therefore, user's attitude to this technique mainly depends on how much it satisfies the users. Although it seems difficult to practice this procedure the first time, it becomes easier after a few repetitions. These days, there is a lot of development to produce the best techniques for venipuncture that can provide the best service for both the medical personnel and the patients.

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