A knowledge survey of medical students about rational tube preparation


| Objective | To survey knowledge of pre-clinical year medical students about rational tube preparation |
| Setting | Faculty of Medicine, Chulalongkorn University |
| Design | Cross-sectional descriptive study |
| Subjects | Fifty 3rd year medical students in the Faculty of Medicine of Chulalongkorn University in academic year 1998 |
| Method | Interview |
| Results | Only ten (20%) of the 50 subjects knew the general rational tube preparation concepts, and these ten subjects could only describe basic knowledge about universal stopper color and proper selection of additives. Only three (6%) of the 50 subjects could describe proper quantities of specimens required for correct laboratory tests. |
| Conclusion | Only a few medical students could describe complete rational tube preparation correctly. Therefore, promotion of this topic should be enhanced. Basic tube guidelines must be available. |
| Key words | Medical student, Rational, Tube preparation. |

Reprint request: Wiwanitkit V. Department of Laboratory Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.

Received for publication. August 5, 1999.

*Department of Laboratory Medicine, Faculty of Medicine, Chulalongkorn University*
วิจัยวิชาการ. การสำรวจความรู้เรื่องด้านภัยภัยกับการใช้หลอดเก็บตัวอย่างเสียบดาย เหมาะสมของนิสิตแพทย์. ชุกกลางกรมเวชสาร 2543 พ.ค. 44(5): 349 - 54

วัตถุประสงค์ : เพื่อสำรวจความรู้เกี่ยวกับการใช้หลอดเก็บยึดสิ่งสังเคราะห์อย่างเหมาะสมของนิสิตแพทย์
สถานที่ทำการศึกษา : คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
วิธีการศึกษา : การศึกษาเรียนรู้ภูมิคุ้มกันด้วยการเรียนรู้
กลุ่มที่ทำการศึกษา : นิสิตแพทย์ชั้นปีที่ 3 จำนวน 50 คน คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ปีการศึกษา 2541

ผลการศึกษา : มีเพียงร้อยละ 20 ของนิสิตทั้งหมด (10 คน) ที่ทราบถึงภัยของหลอดการเสียก ใช้หลอดเก็บยึดสิ่งสังเคราะห์อย่างดี โดยนิสิตกลุ่มดังกล่าวสามารถให้คำอธิบายถึงภัยของหลอดเก็บยึดสิ่งสังเคราะห์อย่างถูกต้อง ความสัมพันธ์ของสิ่งสังเคราะห์กับภัยที่มี ภัยในและหลักการเลือกใช้สารกันเสียสิ่งสังเคราะห์ที่เหมาะสม แต่พบว่ามีนิสิตร้อยละ 6 ของนิสิตทั้งหมด (3 คน) เท่านั้นที่สามารถอธิบายการปริมาณของสิ่งสังเคราะห์ที่เหมาะสมสำหรับการตรวจทางห้องปฏิบัติการได้

สรุป : มีนิสิตจำนวนน้อยมากที่สามารถอธิบายถึงหลักการใช้หลอดเก็บยึดสิ่งสังเคราะห์ที่เหมาะสมได้อย่างสมบูรณ์ การสำรวจความรู้ทางด้านนี้จึงเป็นสิ่งที่จำเป็น ควรจัดให้มีการอธิบายแนวทางสำหรับการส่งตรวจไว้อย่างเพียงพอที่จะมีความรู้เกี่ยวกับการ

ตัวสำหรับ : นิสิตแพทย์, เหมาะสม, การเลือกใช้หลอดเก็บยึดสิ่งสังเคราะห์
Venipuncture is a basic medical procedure that all graduate physicians must perform correctly. Proper procedure is necessary for both preparation and practice. To prepare for a venipuncture procedure, preparation for the practitioner, recipient, and the instrument must be considered. Preparation requires one to have basic knowledge about tube use. Proper tube preparation means using the proper tube type classified by additive and proper numbers of blood specimens depending on the tests required.

In King Chulalongkorn Memorial Hospital, a university hospital in Thailand, all clinical-year medical students have to practice venipuncture with humanistic patient models. Due to the problem of ethics in medical practice, all procedures that medical students practice should reach a standard. Therefore, this pilot study was design to survey basic knowledge about preparations for venipuncture, especially relating to tube guides. The results of this study can assist in improving the training of medical students. Problems identified can be solved before they have to practice the real procedure.

Materials and Methods

This pilot study was designed as a cross-sectional descriptive study. The population in this study were 3rd year medical students of the Faculty of Medicine of Chulalongkorn University during academic year 1998 who were required to practice real patient venipuncture in the following semester. A simple random sampling was used to select 50 subjects (about thirty percent of the class population). All subjects were interviewed using a questionnaire guide (Table 1). Questions in the questionnaire guide were listed by the difficulty of knowledge. Evaluation keys were shown in Table 1. Information from interviewing was collected, analyzed and appraised. Descriptive statistical analysis was used when appropriate. All statistical analysis was two-sided using an 0.05 level of significance.

Results

There were 25 female and 25 male medical students interviewed. There were only 10 students who said they knew the correct guidelines for tube use, their marks from evaluation were shown in Table 2. However, they could only answer questions about universal stopper color and additive selection. And only 3 subjects (2 male and 1 female) could answer questions about proper amounts of specimens required for laboratory tests. Ratio of medical students who knew process of rational tube preparation in each step was presented in Table 3. There was no statistically significant difference between the ratio of rational tube preparation knowledge at each step for the male and female medical students. But the ratio of subjects who could complete all step of tube preparation was significant lower than ones could describe some steps.

Discussion

It is surprising that from this study, there were only a few subjects who knew about rational tube preparation. Furthermore, the number of students who could correctly completely describe steps of preparation principles was even fewer. And the ratio for male and female knowledge of rational tube preparation step of male subjects was not statistically different. Therefore, this knowledge seems to be not sex-dependent. Why medical student cannot complete
Table 1. Questionnaire guide used in this study.

1. Do you know the correct guideline of tube using (Tube Guide)?
   - If answer is “No” ______ stop (0 point)
   - If answer is “Yes” ______ go to question 2 (1 point)

2. Do you know what additives added in these tubes?
   : Red tube, Lavender tube, Gray tube, Blue tube, Green tube
   (Key: no additive, EDTA, fluoride, citrate, heparin)
   - If all answers are not correct ______ stop (0 point)
   - If all answers are correct ______ go to question 3 (1 point)

3. Do you know what these types of specimens used for?
   : clotted blood, EDTA blood, fluoride blood, citrate blood, heparin blood
   (Key: clotted blood for serology test, EDTA blood for hematology test
   fluoride blood for sugar test, citrate blood for coagulation test
   heparin blood for heavy metal test)
   - If answers are not correct ______ stop (0 point)
   - If all answers are correct ______ go to question 4 (1 point)

4. Do you know the proper amount of specimen for these basic tests?
   : serology test, complete blood count, blood sugar, PT & PTT, blood lead
   (KEY: average 2 cc, 2 cc, 2 cc, 5 cc, 5 cc)
   - If answer are not correct ______ (0 point)
   - If answer are correct ______ (1 point)

Table 2. Marks of students who said they knew correct tube guideline from evaluation.

<table>
<thead>
<tr>
<th>Subject number</th>
<th>Sex</th>
<th>Question number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1.</td>
<td>Male</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Male</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>Male</td>
<td>1</td>
</tr>
<tr>
<td>4.</td>
<td>Female</td>
<td>1</td>
</tr>
<tr>
<td>5.</td>
<td>Female</td>
<td>1</td>
</tr>
<tr>
<td>6.</td>
<td>Female</td>
<td>1</td>
</tr>
<tr>
<td>7.</td>
<td>Female</td>
<td>1</td>
</tr>
<tr>
<td>8.</td>
<td>Female</td>
<td>1</td>
</tr>
<tr>
<td>9.</td>
<td>Female</td>
<td>1</td>
</tr>
<tr>
<td>10.</td>
<td>Female</td>
<td>1</td>
</tr>
</tbody>
</table>

education in each topic? These study results reflect many interesting topics in medical education.

That the students may not be able to practice correctly although adequate instruction was provided is a major problem and should be of concern because this practice is a requirement of all newly graduated doctors. Perhaps a lack of clinical experience is the cause. Perhaps insufficient instruction is provided in the pre-clinical year. Perhaps the present tube guidelines are too difficult to understand or are not available. Or perhaps the students do not appreciate the importance of this topic.
Table 3. Ratio of rational tube preparation knowledge in each step of male and female medical students.

<table>
<thead>
<tr>
<th>Step</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>knowledge about general concepts</td>
<td>3/25</td>
<td>7/25</td>
<td>10/50</td>
</tr>
<tr>
<td>universal stopper color</td>
<td>3/25</td>
<td>7/25</td>
<td>10/50</td>
</tr>
<tr>
<td>selection of proper additive</td>
<td>3/25</td>
<td>7/25</td>
<td>10/50</td>
</tr>
<tr>
<td>proper amount of specimen for laboratory tests*</td>
<td>2/25</td>
<td>1/25</td>
<td>3/50</td>
</tr>
</tbody>
</table>

*There was significant lower ratio of subject who could describe this step than the other steps.

Poor practice is based on poor basic knowledge. Poor clinical practice in tube preparation leads to poor basic laboratory skills. A previous study at King Chulalongkorn Memorial Hospital, determined that improper specimens were being sent to the laboratory. These improper specimens resulted in waste of time and money, and in the worst case the patients can be affected.

Following to the principle that pre-clinical year medical students must practice real procedure in the future, therefore, any of their problems identified should be considered and promptly solved. Irrational tube preparation implies more operational definition than poor knowledge. In the present day, concept of standardization and accreditation are widely promoted and discussed. General physician should perform basic medical procedure properly and correctly. Furthermore, allowing not well-trained medical student practice in actual humanistic patient is considered non-ethical and illegal.

This study was only a pilot study. Population in this study is the risk group due to the fact that their real medical practices will start in the next semester. Questions used in this study were all basic knowledge in general Laboratory Medicine textbook. All laboratory tests in the questions are frequently used in the real medical practice. The results of this study could be used in adaptation of the present training program. Proper tube preparation teaching is suggested and proper tube guideline should be available in every ward. Anyway further study should be done to fulfill the information.

Conclusion

Fifty 3rd year medical students were interviewed about basic knowledge about rational tube preparation process. There were very few subjects who could discuss. Suggestion about proper tube preparation knowledge teaching program and easy available tube guide were discussed.

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