

Blood sample collected by laboratory and non - laboratory medical personnel: a comparative study

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Objective : *To compare how proper are the specimens collected by laboratory and non - laboratory medical personnel*

Study Design : *Retrospective descriptive study*

Setting : *Department of Laboratory Medicine, Faculty of Medicine, Chulalongkorn University*

Subject : *1,297 specimens collected in anticoagulant - added blood collection tubes sent to the Clinical Chemistry Unit, Division of Laboratory Medicine, King Chulalongkorn Memorial Hospital during December, 1998*

Method : *Examination of each specimen was performed. All data were collected, categorized and analyzed*

Results : *There were 813 specimens collected by non - laboratory medical personnel and there were 484 specimens collected by laboratory medical personnel. The incidence of improper specimens was 30 specimens (2.3 %). There was no significant difference of ratio of improper specimens in either quality and quantity between two groups of collectors.*

Conclusions : *In general, the ratio of improper specimens collected by the laboratory and non-laboratory medical personnel are not different. Proper specimen collection should be promoted.*

Key words : *Blood sample, Medical personnel.*

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- รูปแบบงานวิจัย** : การศึกษาเชิงพรรณนาแบบย้อนหลัง
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- วิธีการ** : ทำการตรวจสอบตัวอย่างแต่ละตัวอย่าง นำข้อมูลที่ได้มารวบรวมประมวลผลและวิเคราะห์
- ผลการศึกษา** : มีตัวอย่างเลือดในการศึกษาจำนวน 813 ตัวอย่างที่เก็บโดยบุคลากรทางการแพทย์จากห้องปฏิบัติการ และจำนวน 484 ตัวอย่างที่เก็บโดยบุคลากรทางการแพทย์อื่น ทั้งนี้อุบัติการณ์ของตัวอย่างเลือดที่ไม่เหมาะสมเท่ากับ 30 ตัวอย่าง (2.3 %) ไม่พบความแตกต่างอย่างมีนัยสำคัญระหว่างอัตราส่วนของตัวอย่างที่ไม่เหมาะสมทั้งในเชิงปริมาณและเชิงคุณภาพระหว่างทั้งสองกลุ่มที่ทำการศึกษา
- สรุป** : ไม่พบความแตกต่างอย่างมีนัยสำคัญระหว่างอัตราส่วนของตัวอย่างที่ไม่เหมาะสมระหว่างทั้งสองกลุ่มที่ทำการศึกษา ได้เสนอแนะให้จัดการส่งเสริมการเก็บตัวอย่างอย่างเหมาะสม
- คำสำคัญ** : ตัวอย่างสิ่งส่งตรวจประเภทเลือด, บุคลากรทางการแพทย์

Specimen collection is an important step in laboratory procedures⁽¹⁾ and many laboratory tests require blood specimens.⁽²⁾ Both the quality and quantity of blood specimen are important because improper blood specimen cannot result in accurate laboratory results.⁽³⁾ There are many medical personnel who play roles in blood specimen collection. The two major groups are laboratory medical personnel and non-laboratory medical personnel.

In King Chulalongkorn Memorial Hospital, laboratory medical personnel most often conduct blood sample collection in the Out Patient Department (OPD) and non-laboratory medical personnel conduct the collection in the In Patient Department (IPD). This study was to compare the specimens obtained by the laboratory and non-laboratory medical personnel. The results of this study can be used by staff management for specimen collection procedures.

Materials and Methods

This was a retrospective descriptive study. The subjects were specimens collected in citrate anticoagulant-added blood collection tubes sent to the Clinical Chemistry Unit, Division of Laboratory Medicine of King Chulalongkorn Memorial Hospital during December, 1998. Due to the fact that the services of the laboratory are the same in every month, only specimens in a single month period were included in this study. Each specimen was examined then categorized as proper or improper by a medical technologist at the coagulation test laboratory station. Operative definition of laboratory medical personnel was defined as medical technologist or assistant and operative definition of non-laboratory medical

personnel was defined as physicians and medical students. The results of each investigation were recorded in tabular collective form. All results were collected, analyzed and interpreted. Analytic statistical analysis was used when appropriate. A two-tailed T-test was used in comparison. A P-value less than 0.05 was accepted as indicating statistical significance.

Results

From a total of 1,297 specimens included in this study, 813 specimens had been collected by laboratory medical personnel and 484 specimens were collected by non-laboratory medical personnel. The count of improper specimens was 30 specimens (2.3 %), errors in quality totaled 17 specimens and errors in quantity totaled 13 specimens (Table 1). There was no significant difference of ratio of improper specimens between the two collection groups ($P > 0.9$). There was no significant difference of ratio of combined improper specimens in quality ($P > 0.1$) and quantity ($P > 0.5$) between the two collection groups. Considering the details, the only significant difference was between the ratio of too small specimens between the two collection groups ($P < 0.05$).

Discussion

Collected blood specimens need to be correct so that the laboratory procedures can be successfully performed. All medical personnel who have roles in specimen collection should be careful in these procedures. Although there was a low valid percentages (2.3 %) of improper specimens in this study but each improper specimen implies lost of

Table 1. Specimens included in this study.

Specimen	Non laboratory medical personnel	Laboratory medical personnel
Proper	796	471
Improper		
- in quality		
• Clot	4	7
• Hemolysis	4	2
- in quantity		
• Too much	3	4
• Too little*	6	0

*There was significant difference between ratio of that type of specimen between two groups.

time and money for recollection.⁽³⁾ In general, specimens collected by laboratory and non-laboratory medical personnel seem no different in quality and proper quantity. But in detail the ratio of too small specimens collected by the non-laboratory medical personnel is significantly more than for the laboratory.

Concerning this point, the basic general practice about blood specimen collection from the laboratory and non-laboratory medical personnel is rather similar. But the knowledge about required quantities of blood specimen for laboratory test by the non-laboratory medical personnel may be not as good as among the laboratory medical personnel. This is not surprising topic as laboratory medical personnel have to deal with the specimen in their practice more than personnel in the clinical wards. A previous study among medical students revealed that their knowledge about rational tube preparation for blood specimen collection was not very good.⁽⁴⁾ Although medical students are the personnel who will have to play important roles in specimen collection in the future, their knowledge was not satisfactory.

Therefore, when considering other staff in wards, their knowledge may be even lower. Further study to evaluate the knowledge of medical personnel about this topic should be conducted.

Blood collection is in the pre-analytical phase of the laboratory cycle⁽⁵⁾, thus validation in practice should be confirmed. From this study, conclusion that collection procedure should be performed well in both laboratory and ward is suggested. Therefore, proper collection technique should be taught to every related medical personnel.

This was a retrospective study. Therefore, bias about the cause of improper specimens cannot be controlled. But there is also limitation of the retrospection of the study so group categorization is limited only two major groups. Therefore, some deviations from quality of subject in each group cannot be avoided. Although the result of the study indicated that there was no difference between collection by the two groups, but this study was limited in only one setting, therefore, in other setting, there might be some difference. Staff management for specimen

collection procedure should be carefully done. Training is still important topic that should not be neglected.

The subjects in this study were not living so problems of drop out occurred. Additionally, only citrate-anticoagulant added blood specimens were studied, therefore, there may be some differences in use of other types of anticoagulants.

Conclusion

A retrospective descriptive study to compare specimens collected by laboratory and non-laboratory medical personnel was conducted. The study revealed that there was no significant difference between these two groups.

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