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Errors in Handling Patient's Specimens in Laboratories of Basrah Hospitals

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***Abstract*---**Aim: This study was conducted to illustrate the errors in handling patient's specimen all the way from patients to laboratory. Material and method: Outpatient staff, patients, and laboratory staff asked to answer questions in three separated questionnaire forms during the period between February-April 2016. One hundred and thirty-eight individuals asked to answer questions in three separated questionnaire forms, 34(24.64%) outpatient staff, 53(38.41%) patients and 51(36.96%) laboratory staff in different hospitals in Basrah. Among the patient group, 25 (47.17%) males and 28 (52.83%) were

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females. SPSS version 20 used for analysis the data. Results: Among the outpatient staff, 61.76% do not invert the tube to mix blood specimen with anticoagulant, 58.82% do not check expiration date on the tube before usage. Also 41.18% do not explain to the patient how to collect the specimen. Among patient group, 12% males and 21.43% females wash the urinary opening and the surrounding areas before collecting urine specimen. Percentage of females who give the specimen immediately to outpatient staff (46.43%) was statistically significant in comparison to men (P-value was 0.04). Among laboratory staff, 54.90% do not mix delayed urine specimen before testing, 50.98% do not wait (10-20) minutes before centrifuging blood specimen and 49.02% do not refuse saliva specimen if sputum required for testing. Also 41.18% do not refuse hemolyzed or lipemic blood specimen. Conclusions: The current study indicated some errors in pre-analytical steps done first by patients in obtaining the required specimen in a proper way. Outpatient staff seem to have some errors in explaining to patients how to obtain their specimens also their handling, processing and sending these specimens to the laboratory staff seems to be not perfect enough. There were also some errors during the post-analytical steps done by laboratory staff.

***Keywords*---**errors, handling, patient, specimen, laboratory.

Introduction

Recently, there was increasing attention to improve the quality of healthcare activities for patients Worldwide, focusing on the quality of clinical laboratory's results. The total testing process depends first on what clinician think about the possible diagnosis, test selection, collection of patient's sample, transportation to the laboratory (pre-analytical steps), second it depends on analysis, and sending report back to the clinician (post- analytical steps)(1). Many studies indicated many errors in between these steps for example; missed results that lead to delay in treatment and improper laboratory diagnosis (2). The overall defect rate in healthcare in United States during 2009 was (31-69%) (3). A study concerned in assessing error rates in 1996 and 2006 found that rates basically the same in both years (4). Developed techniques used in some laboratories to detect errors and improving the testing methods (5). The causes of errors include inappropriate test request, order entry, misidentification of patient and specimen, sample collection errors, hemolysis, clotting, insufficient quantity, inappropriate container, handling, storage and transportation (6). The ISO 15189: 2007 standard have designed to develop the quality management systems of medical laboratories (7). The present study aimed to recover the errors in handling the patient's specimen all the way from patient to the laboratory because as we all know that these errors lead to adverse outcomes for the patient.

Materials and Methods

Outpatient staff, patients, and staff of diagnostic laboratories in hospitals asked to answer questions in three separated questionnaire forms (Appendix 1). SPSS

version 20 used for analysis of data. This study had carried out in College of Medicine during the period between February-April 2016 to illustrate the errors in handling patient's specimen all the way from patients to laboratory. Total of 138 individuals were asked to answer questions in 3 separated questionnaire forms, 34(24.64%) were staff of outpatient laboratory, 51(36.96%) were staff of the diagnostic laboratories in several hospitals in Basrah and 53(38.41%) were patients attending hospitals. Among the patient group, 25 (47.17%) males and 28 (52.83%) females.

Results

Distribution of outpatient staff according to handling of patient's specimen

Out of 34 staff, 58.82% have a documentation book in their laboratory, (52.94%) had proper labeling and completing the form information. 67.65% of staff have some delay in sending the specimen to the laboratory for testing and 58.82% explain to the patient how to collect the specimen. The percentage of staff who pour blood from one tube into another tube to send it to other laboratories was 35.29%. Also 41.18% check expiration date on the tube before usage, 38.24% invert the tube to mix the blood sample with anticoagulant and 50% wear gloves. Among the staff, 41.18% send the specimen in a proper way to the lab for testing, and 58.82% pour urine in a transport tube after receiving it from the patient.

Distribution of patients (males and females) according to the obtaining of required sample

Table.2 showed that out of 53 patients, only 8% males and 28.57% females know what kind of specimen they must obtain, 12% males and 21.43% females wash the urinary opening and the surrounding areas before collecting urine specimen. Results indicated that 46.43% of females showed statistically significant association with behavior in giving the specimen immediately, P-value was 0.04.

Patient's specimen handling by laboratory staff for testing

Table.3 illustrated patient's specimen handling by laboratory staff. Among the laboratory staff, 62.75% do not wear gloves, 54.90% do not mix delayed urine specimen before testing, and 52.94% do not change the contaminated test paper. Results in Table.3 indicated that 50.98% of staff do not wait (10-20) minutes before centrifuging blood specimen, 49.02% do not refuse saliva specimen if sputum required for testing, and proceed with testing the specimen. Results also showed that 41.18% of the staff do not refuse hemolyzed or lipemic blood specimen, 35.29% do not refuse improper labeled specimen and accept it even if the information on the test paper are not fully documented, such as the age of patient, time of collection. Also 35.29% of the staff do not have documentation book. Results also indicated that 33.33% of the staff do not keep urine specimen in refrigerator for further testing. Table.3 illustrated that 31.37% of the staff delay the testing of urine specimen more than (1 hour), and 15.69% said that they do not know what and where is the discard place.

Discussion

The quality and accuracy of laboratory results depends on many variables during pre-and –post-analytical steps, the patient, outpatient staff and the laboratory staff. The patient must prepare and know how to obtain the specimen. In the present study, results indicated that 46.43% of females showed statistically significant association with behavior in giving the specimen immediately, P-value was 0.04. Only 8% males and 28.57% females know what kind of specimen they must collect (midstream, first morning, or 24 hours urine pool), only 12% males and 21.43% females said that they wash the urinary opening and the surrounding areas before collecting urine specimen. In that situation, urine might been contaminated with normal flora present on these areas and the laboratory test give false positive results (8). 36% males and 32.14% females said that they rinse their mouth before giving throat swab or sputum for culture, which might lower the chance of false results. Outpatient staff play major role in accurate obtaining of specimen, first they must explain to the patient the proper method in obtaining and collecting the specimen. The staff also must have the skill, knowledge and care in handling the specimen after receiving it from the patient. Results indicated that only 58.82% said that they have a documentation book. We noticed that outpatient staff does not care about complete documentation. Documentation is essential by mentioning the patient's first and last names, date of birth, type of specimen, type of test required, date and time of collection, and time of sending the specimen to the diagnostic laboratory. Labeling errors cause serious misinterpretation of test results. A percentage 52.94% of the outpatient staff had properly label and complete the form information but without mentioning the time that is very important. Among the errors in handling patient's specimen, 32.35% of outpatient staff delayed in sending the specimen to the laboratory for testing. Delayed specimen may affect the result (9) and causing false negative, overgrowth, or contamination in case of bacteriological examination (10), (11). Most of the staff does not wear gloves when they handle patient's specimen, first this might affect the results by causing contamination in these specimens. Second, the staff might be at risk if the specimen is infectious. Also 58.82% of the staff does not check expiration date on the tube before usage, which might affect the test results if it exceeds the expiration date. Nearly 61.76% of the staff does not invert the tube to mix the blood with anticoagulant. This must be done immediately because the blood might be clotted and be no more accurate for testing (12). A percentage 58.82% of the staff do not send the specimen in a proper way to the laboratory, 41.18% do not pour urine in a transport tube or suitable locked container after receiving it from the patient prior for sending it to the diagnostic laboratory. Most laboratories in the world have policy for mislabeled specimens, by refusing it. In the present study many errors, 35.29% of the laboratory staff do not refuse improper-labeled specimen. Also 62.75% do not wear gloves. Approximately 50.98% do not wait 10-20 minutes before centrifuge the blood specimen. Improper handling and centrifuging might cause inaccurate results. Also 41.18% of the staff do not refuse hemolyzed or lipemic blood specimen. Releasing the hemoglobin from RBCs causes hemolysis that might be internal related to many disorders in the patient, or might cause by external factors (improper techniques of venipuncture, or shaking the specimen. Hemolysis causes interference with testing and cause false results (13). Lipemic serum, the excess of lipid in the blood increases turbidity of the specimen and

interfere with testing and the results (14). The 31.37% does not test urine within 1 hour, 33.33% does not keep it in refrigerator for further testing, 54.90% does not mix delayed urine specimen before testing, which might cause false positive and false negative results (9). Approximately 25.94% do not change the contaminated test paper. The 15.69% answered that they do not know where the waste being discarded. During obtaining the survey, we noticed many errors in the laboratories like eating in the laboratory.

Conclusions

We concluded from the present study that patients, staff of outpatient and diagnostic laboratories, do many errors in obtaining, handling the patient's specimen which may affect results of the testing and have adverse effect on the patient.

Recommendations

Patients, staff of outpatient and diagnostic laboratories need more instructions and knowledge about the exact protocol of handling the specimen to further testing. This could be done by educational lectures to the staff periodically and knowledge of advanced updates in laboratories around the world.

References

1. Laposata, M., Dighe, A. "Pre-pre " and "post-post" analytical error: high-incidence patient safety hazards involving the clinical laboratory. Clin Chem Lab Med. 2007; 45: 712-719.
2. Wahls, TL., Cram, PM. The frequency of missed test results and associated treatment delays in a highly computerized health system. BMC Fam Pract. 2007; 8: 32.
3. Leape, LL. Errors in medicine. Clin Chim Acta. 2009; 404: 2-5.
4. Carraro, P., Plebani, M. Errors in a stat laboratory: types and frequencies 10 years later. Clin Chem. 2007; 53: 1338-1342.
5. Lippi, G., Plebani, M. Importance of incident reporting in laboratory diagnostics. Scand J Clin Lab Invest. 2009; 69: 811-813.
6. Plebani, M.The detection and prevention of error in laboratory medicine. Ann Clin Biochem. 2010; 47: 101-110.
7. International Organization for Standarization, ISO 1589: Medical laboratories-particular requirements for quality and completence. Geneva: International Organization for standardization. 2007.
8. Kaplan, LA., Pesce, AJ., Kazmierczak, SC. Clinical Chemistry: Theory, Analysis, Correlation. 4th ed. Mosby; 2003: 1092-1109.
9. Queen, E., Ifeanyi, OE., Chinedum, OK. The Effect of storage on Full Blood Count in Different Anticoagulant. IOSR Journal of Dental and Medical Sciences. 2014; 13(9): 128-131.
10. CLSI Guideline, Urinalysis; Approved Guidline-Third Edition, GP16-A3, Vol. 29 No 4, 2009.
11. Skobe, C. Preanalytical variables in urine testing. BD Lab Notes 2006; 16(3): 1-7.
12. Lippi, Giuseppe, Salvagno,G.L., Manaontahn, MD. 2007; 38(12): 723-725.