

PREANALYTIC ERROR - STILL A CHALLENGE TO OVERCOMEMaj Gen (Dr) Debashish Saha¹, Lt Col Dr Lubna Nazneen²¹*Ex-Commandant*, ²*Senior Clinical Biochemist, AFIP*

Laboratory Services is now recognized to have an increasingly important role in patient care. It is estimated that more than 70% of clinical decisions are basing on information derived from laboratory test results¹. But, laboratory Processes are open to human error causing a significant blow on clinical outcome. Lab automation with implementation of LIS and use of modern autoanalyzers not only have greatly cut down many tiresome everyday works at laboratory, but also has significantly improved the error rate in all three, pre-analytical, analytical, and post-analytical phases. Still more concern lies with preanalytical errors as it accounts for nearly 60%-70% of lab errors² and most of them are preventable. Preanalytical errors start with selection of tests by physicians to patient preparation, patient identification, specimen collection, handling, transportation, storage and end up with sample preparation for analysis. An interesting fact came out in a study that increased incidence of preanalytic error occurs at night shift comparing to morning shift³. The commonest error was entry of incorrect patient information, 23.5% versus 16.5% and the second common was discordant test entry for the requested tests into the hospital information system, 10.1% versus 7.1% and inadequately collected blood volume, 3.2% versus 2.9% for the night versus morning shift. This significant difference seemed to derive from the facts of staff change, more staff number and working of more experienced staffs during the morning shift in contrast to night shift³. Studies have shown preanalytic errors happen less when dedicated laboratory personnel collect blood samples as opposed to nursing or other health care personnel⁴. Adverse events

have been reported to occur from one out of every 18 specimens with patient identification errors alone⁵. Here, the lab authority has to re-think for regular training of concerned personnel for improvement in preanalytic phase.

Such errors can be overcome with the strict adherence to standard operating procedure of using at least two identification points or by verification of information on the patient's wrist band and proper labeling of the test tubes before drawing blood. The use of bar coding technology for patient identification can minimize this potential source of error⁶. Proper venipuncture technique, following order of draw, proper tube mixing, collection of correct specimen volume, avoidance of traumatic venipuncture, and avoidance of vigorous shaking of tubes are important for maintaining specimen quality. Specimen is to be transported to the lab departments with careful maintenance of appropriate temperature and adequate protection from light. Proper patient preparation is vital to obtain meaningful test results. It is the laboratory responsibility to define the instructions and procedures for patient preparation and specimen acquisition. Another important issue is to take into account that, more than one-fourth of all pre-analytical errors are estimated to be due to unnecessary investigation or inappropriate patient care. These result in additional financial burden on healthcare system⁷. Clinicians can play a vital role in this regard, like ordering test when it is appropriate, writing down the test name clearly, giving clinical notes when needed, and explaining the ordered test and preparation for the test to the patient. Ineffective communication among health care professionals is recognized as one of the leading causes of medical errors⁸. Hence,

physician should communicate with the lab whenever in doubt in relation to patient preparation to test result not matching with patient's status or for the emergency management.

However, despite the improvements in preanalytical automation, this phase still remains the most error prone chapter of laboratory 'Total Testing Process'. In fact, it is a complex process, as many of the steps occur both before and after the specimen reaches the laboratory. A combined effort, dedication and cooperation among all the members of the health care team is essential to minimize this avoidable preanalytical errors. Relevant academic and professional institutions/organizations can come forward in this regard by arranging lecture, seminar or workshop utilizing the available experts in the field to disseminate the practical knowledge, to all the stakeholders involved in Biochemistry laboratory.

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