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Is Repeat Testing Of Critical Results In Clinical Biochemistry Laboratory A Necessity?.

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ABSTRACT

A common laboratory practice is to repeat critical values before reporting the test results to the clinical care provider. This maybe an unnecessary step that delays the reporting of critical test results without adding value to the accuracy of the test result. The objective of this study was to find out changes in laboratory values after retesting of samples with critical values and conclude usefulness of such retesting. A retrospective audit of repeat tests of blood glucose, Na, K, Ca, Mg, was done for 7 months at the Clinical Biochemistry laboratory. Data on initial and repeat test value were collected. Difference of 10% & above between the original value & repeat value was considered to be significant. The difference was further categorized into values giving <10% difference and >10% difference. Out of 506 samples difference of 10% & above between the original value & repeat value was observed only in 28 samples. In the above study we conclude that instead of repeating samples it is advised to have a stringent IQC program & its implementation.

Keywords: clinical biochemistry, retesting, blood parameters.

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INTRODUCTION

Retesting samples showing critical values is a common practice in clinical laboratory. This increases the economical and man labor costs of the analytical processing making it an unnecessary step with no accuracy of the test result. Repeating a test to account for inherent imprecision in the results and ensure accuracy is a well-established practice in laboratories. This causes some delay in reporting the critical test results, and consequently delays physician intervention. To minimize this turnaround time, we conducted a study to check whether performing rechecks are necessary.

MATERIALS AND METHODS

The study was conducted in a tertiary care hospital where a retrospective audit of repeat testing of blood glucose, Ca, Mg, Na, K, was done for the period from January 2016 to July 2016. Data of initial and repeat test values were collected for each of the above-mentioned parameters. Difference of 10% & above between the original value & repeat value was considered to be significant. 2 level internal quality control records of above parameters were also recorded. A total of 506 samples with critical values which were rechecked were studied. Difference between initial and repeat values was noted. The difference was further categorized into values giving <10% difference and >10% difference.

RESULTS

Table 1: Parameters and their testing

Sr. No.	Parameters	No. of sample retested	<10%	>10%	Remarks
1	Blood glucose	122	118	4	
2	Sodium	87	86	1	Hemolysed sample
3	Potassium	205	197	8	
4	Calcium	88	76	12	
5	Magnesium	4	1	3	

506 samples were retested for either of the 5 test parameters mentioned above. Difference of 10% & above between the original value & repeat value was observed only in 28 samples. IQC results were consistent & showed no major outliers. Wherever there were IQC deviations, appropriate corrective actions were taken before processing the samples.

DISCUSSION

In a study conducted by Deetz et al.,a total of 855,009 results were evaluated for differences from the CAP allowable error limit. The tested for common chemistry tests (six types of electrolytes, three types of drugs, four types of immunoassay-detected analytes, three types of arterial blood gases, and 14 other routine clinical chemistry analytes) yielding [3]. Large differences (initial value vs. repeat value) were found for 2.6% of all repeated tests. Moreover, of these 668 errors, only 102 (electrolytes, n=1; drugs, n=2; immunoassay-detected analytes, n=0; arterial blood gases, n=52; routine clinical chemistry analytes, n=47) represented specimens with initia(l values that fell within the AMR (0.5% of all repeated values). These findings suggest that when initial results are within the AMR, the repeated testing is unnecessary and may only serve to delay the reporting of result and critical care decisions [1]. According to another study by Chima HS, Ramarajan V,et al, Of the 699 tests that were repeated, 580 had values that fell in the CV and early notification ranges (82.9%). They had no reportable patient care issues as a result of implementing this change after follow up for six months .This change improved their laboratory's efficiency and TAT in critical cases and improved patient care [2]. Research by Aijun Ni., Xianxia Yan et al got the similar results. In their study, of the total 601 repeated chemistry critical values, 572 were characterized as within the AMR [3]. On repeated test runs by Adam D toll et al, 97% of the specimens with critical HGB and critical WBC results revealed a maximum absolute difference of only 0.2 g/dL and 100 cells/ mL, respectively. The mean results obtained for the absolute value and the percentages of difference for all 5 test categories were well within our laboratory's preset and not clinically significant [4].

Another solution to minimize the TAT is autoverification. It increases efficiency within the clinical laboratories. The autoverification rate for tests performed in the core clinical chemistry laboratory has increased over the course of 13 years from 40% to the current overall rate of 99.5% [5]. Moreover Rasha Mosallam, MD, DrPH et al highlighted on the practice of critical value reporting which is equally important. Lack of written procedures, read-back policy, and documentation of the results of reporting has been also a problem [6].

CONCLUSION

Based on above findings it can be concluded that, if the laboratory implements stringent Internal quality control then the test results are always reliable. Autoverification can be explored as limited research is available. Rather than repeating samples it is advised to have a stringent IQC program & its implementation [7]. Doing it right the first time saves time and help in early management of patient. Also, it saves technical work, man-hours and financial burden of repeats.

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