Research Paper

Volume : 5 | Issue : 6 | June 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

# A Study of Critical Alerts in a Clinical Laboratory of a Tertiary Health Care Center

Medical Science

**KEYWORDS :** Critical values (CV), Critical Alert (CA), Clinical Pathology.

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## ABSTRACT

*AIMS& OBJECTIVES : Our study was to analyze the prevalence of critical alert values and their significance. To assess the standard Operating Procedures and the guidelines for detection of critical alert values in this health care center.*

*MATERIALS AND METHODS: This study was conducted in Madha Medical College Hospital & RI, Thandalam Kovur, during the year 2015April -2016 April.*

*We studied the data of Critical alert values from the major disciplines of the central clinical laboratory viz: Clinical pathology and Biochemistry. The critical alerts of these departments were analyzed in comparison to the total number of patients investigated. The process of critical alert detecting, conveying and documenting was also scrutinized.*

*RESULTS: It was observed that a total of 12,216 cases were registered over the one year study period. Of these total cases a 252 cases (2.0%) were reported to have flashed a critical alert value , of which 156 (1.277% ) cases from biochemistry and 96 (0.78%) cases from Clinical pathology were documented.*

*DISCUSSION: The critical values in use are based on national published standards. These laboratory results indicate a probable life-threatening situation for the patient. These values need to be reported and notified urgently to the appropriate physician incharge. Although virtually all laboratories have tests with critical limits, surveys have shown that there is no universal alert value list.*

*CONCLUSION: This study reflects the need for increased awareness among both laboratory and health care service providers about the Critical alerts. The study emphasizes the importance of standardized monitored investigations especially in patients suffering from chronic metabolic diseases.*

## INTRODUCTION

Critical values are the key indicators that bring an alert to the clinical status of the patient. These laboratory results indicate a probable life-threatening condition for the patient. These values are reported and notified immediately to the physician incharge. The recommendations for improving the quality of laboratory include 1. A critical values list approved by the clinical and laboratory professionals. 2. A written policy for handling the initial and repeat critical values reports. 3. A foolproof policy for tracking the Critical value information to clinicians.

Although virtually all laboratories have tests with critical limits, surveys have shown that there is no universal alert value list. [1] The significance of a critical alert in one discipline or field of science is different from that of the other. The very positive detection of certain test's is considered as critical viz; HIV, whereas a positive urine pregnancy test is not a critical alert.

| TEST | Low Critical Value | High Critical Value |
|---|---|---|
| HEMOGLOBIN Adult | < 6 G/DL | >20 G /DL |
| HEMOGLOBIN Neonate | < 9.5 G/DL | >22G/DL |
| WBC | <2X10$^3$/MM$^3$ | >30X10$^3$/MM$^3$ |
| PLATELET COUNT | <40X10$^3$/MM$^3$ | >10,000X 10 $^3$/MM$^3$ |
| BILIRUBIN | NONE | >15MG/DL |
| BUN | 2MG/DL | >80 MG/DL |
| GLUCOSE | <70 MG/DL | >300MG/DL |
| CREATININE | 0.4MG/DL | >2.8MG/DL |
| SODIUM | <120MEQ/L | >160MEQ/L |
| POTASSIUM ADULT | <2.8 MEQ/L | >6.7 MEQ/L |
| KETONURIA | | POSITIVE |

## MATERIALS AND METHODS:

This study was conducted in Madha Medical college Hospital & RI Thandalam Kovur, during the year 2015 April-2016 April. We studied the data of Critical alert values in our central lab from the major disciplines of the clinical laboratory [Table 1] viz: Clinical pathology and Biochemistry. The critical alerts of these departments were analyzed in comparison to the total number of cases investigated. The process of critical alert detection, communication and documentation was analyzed

**Table 1.**

The prevailing CV alert list implemented in our Central Lab service Table 1, is considered acceptable

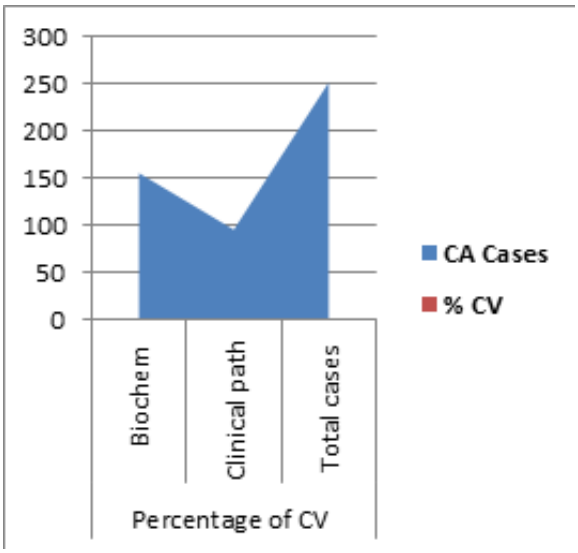
## RESULTS:

It was observed that a total of 12,216 cases were registered over the one year study period. Of these total cases 252 cases (2.0%) were reported to have flashed a critical alert value, of which 96 (0.78%) cases from Clinical pathology and 156 (1.277%) cases from Biochemistry were documented [Table 2]

**Table 2:**

| Item | Biochemistry | Clinical pathology | Total |
|---|---|---|---|
| CA cases | 156 | **96** | 252 |
| CV% | 1.277 | 0.78 | 2% |

**Figure 1:**




**DISCUSSION:**

Observations of the role of service laboratory - Whenever a critical value has been obtained (and verified as critical) the laboratory takes the responsibility to notify the requesting physician or the assistant immediately. The laboratory takes all reasonable measures to contact the concerned physician or another member of the patient's healthcare to deliver or report the critical value. The laboratories also maintain the documentation of the CV notification process (tracking communication).

Critical values lists have been used for many years to decide when to notify physicians and other caregivers of potentially life-threatening situations. The accepted critical alert value list varies from lab to lab; thus no universal alert value list prevails. [2, 3] This probably is due to the trend in establishing super specialty clinics and hospitals catering to a defined category of clinical conditions. Thus the percentage of critical alerts in these service laboratories would reflect the status of a confined group of clinical conditions alone.

The incidence of abnormal values with the age and gender factors has a variation in critical alert criteria

The significance of the CV and CA registers aid in understanding the frequency of CV occurring in specific clinical conditions. This reflects the need for modifying the therapeutic regime for a better management. Hence the mandatory implementation of CV and CA records in clinical laboratory is of much value.

The service laboratory needs a periodical review of the critical limit lists with appropriate clinical interaction and input to avoid unnecessary alert calls to physicians. However it is the responsibility of the clinician also to furnish details of any drug therapy that would reflect on the biomedical values.

**CONCLUSION:**

This study reflects the need for increased awareness among both laboratory and health care service providers about the Critical alerts. The study emphasizes the importance of standardized monitored investigations especially in patients suffering from chronic metabolic diseases.

We hope and trust the present study enables in enhancing the awareness of CV in clinical management of patients.

**ACKNOWLEDGEMENTS:** Laboratory Staff MMCH&RI, Thandalam, Kovur.

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