

Critical alert values in cytopathology

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Abstract

Introduction: Critical values (CVs) in clinical pathology is a well known entity that necessitates immediate notification of the physician to initiate rapid and prompt treatment. This concept has gained significance in cytopathology recently. **Aim:** 1. To evaluate the CVs in cytology reports from January 2011 to June 2013 and its utility in the health care delivery. 2. Perceptions of clinicians about the utility of Critical Values in cytology. **Materials and Methods:** We reviewed the documented cases of CVs among 23000 cytopathology reports. Cases considered CVs included bacteria and fungi in fluid cytology, Pneumocystis fungi or Cytopathic changes in Pulmonary cytology specimens, Unexpected malignant cells in cytology and Polymorphs in Synovial fluid. A survey was conducted among clinicians to rate the usefulness of critical alert values on a scale of 1 to 4 as follows 1. No need of phone call. 2. A phone call should be done but no change in treatment. 3. Stat phone call needed not sure if change in treatment. 4. Stat phone call needed for prompt treatment. Another survey was also conducted on the mode of communication of critical alerts and most of the clinicians favoured a need of stat phone call to their cellular phones rather than land line phone. **Results:** We identified 58 CVs documented in our cytology specimens of 23000 during the study period. Among these 78.3% were Non-Gynecology specimens. Most common CV was AFB positive smears (n=26) 44.8%. The next common was unexpected malignancies 23 cases (39.6%) .6 cases (15.7%) were polymorphs in synovial fluid. CSF showed polymorphs in 3 case (5.2%). Among the gynaecology specimens no Herpes in Pap smears of near term pregnancies were identified. Survey among clinicians were done most of them voted for a immediate phone call for prompt treatment and the best mode of communication preferred was call to the mobile phones. **Conclusion:** Though the overall number of CVs in cytopathology is low but we feel that practise of CVs in cytology is very important in preventing the undesired delay in patient management.

Keywords: Critical alert values, cytology

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INTRODUCTION

Concept of critical values was first attributed by George D Lundberg in the year 1972. In his article entitled "When to Panic over an abnormal Value" he recounted patients death due to complications of hypoglycemia because of series of miscommunication and delays in giving the lab report that postponed the immediate therapy. This laid to

Lundbergs definition of CV as "The laboratory values which reflect pathophysiological derangement at such variance with normal as to be life threatening if therapy is not instituted immediately."¹ The concept of critical value was initially started in the field of Biochemistry and clinical pathology and recently has been recommended in Cytopathology to identify abnormal values that need rapid correction for better patient outcome.² Critical Value has five process entwined together:

1. Defining the critical values.
2. Identification of an abnormal important value.
3. Effective communication.
4. Prompt Therapy.
5. Good outcome of the patient.

Many committees and various organizations joined together (College of American Pathologists, Joint commission on Accreditation of health care organization, Association of directors of Anatomic and Surgical Pathology and Clinical Laboratory Improvement

Amendments of 1998) emphasized the role of critical values in pathology and they recommended that every laboratory has to customize their critical value list for better patient care and to improve their health care delivery systems.³

MATERIALS AND METHODS

1. Defining the critical values in cytology.
2. Evaluation of incidence of Critical Values documented among 23000 cytopathology reports from Jan 2011 to June 2013
3. Survey conducted among 50 clinicians about the practice of critical values in different cytopathological conditions

Participants were asked to categorize the different critical alert values from 1 to 4 as follows

1. There is no need for a phone call, this report can be sent by routine time and manner.
2. A phone call should be done but will not change treatment
3. A stat phone call should be made but not sure if it will change treatment or management
4. A stat phone call should be made because prompt treatment or stat evaluation of the patient is needed.

Best mode of communication was also surveyed

1. Call to Mobile phone

2. SMS
3. E mail
4. Call to landline Extension Number

Criteria for critical value alerts in cytology at SriRamachandra University were

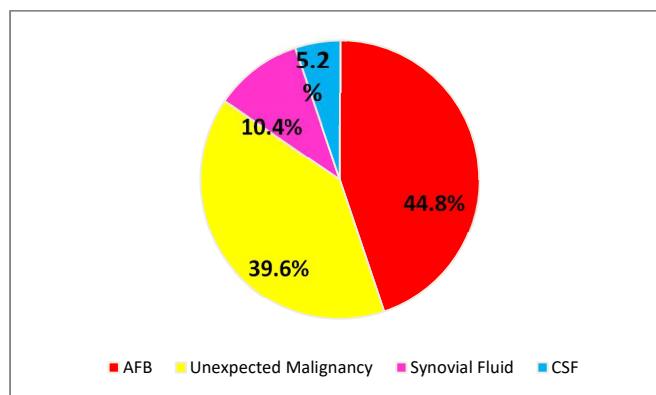
1. Unexpected Malignancy
2. Acid fast bacilli in immunocompromised patients
3. Fungi in FNA of Immunocompromised patients
4. Herpes in Pap smears of near term Pregnant patients
5. Bacteria or fungi in cerebrospinal fluid cytology in Immunocompromised or Immunocompetent Patients
6. Polymorphs in Synovial fluid
7. Significant disagreement between immediate interpretation and final FNA diagnosis
8. Significant disagreement or change between Primary pathologists and outside pathologist consultation
9. Unexpected benignancy.

OBSERVATION AND RESULTS

During the period of one year, out of 23000 cytology reports 58 critical alert values were identified. The first among the list is AFB positivity in immunocompromised patients (n =26) 44.8%, Second most common was unexpected malignancy (n = n23) 39.6%,

Table 1: Shows the distribution of Critical Value Alert in Cytopathology

Critical Alerts	Total Number	Percentage
AFB	26	44.8%
Unexpected malignancies	23	39.6%
Synovial fluid	6	10.4%
CSF	3	5.2 %



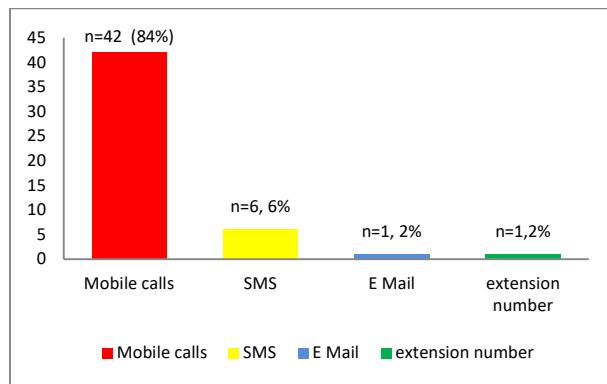
From the survey performed among the clinicians about the utility of critical alert values most of them felt that it is very essential in cases of category 4 (Stat phone call needed – prompt therapy is essential. Majority of them felt that AFB in immunocompromised (n =35) and

unexpected malignancies (n=35) has to be immediately informed. 2nd most common that was rated essential for treatment was significant disagreement between pathologists (n=34).

Table 2: Enumerates the Critical Value in to further categorization as per the survey among the clinicians

	Category 4	Category 3	Category 2	Category 1
Herpes in Pap Smear	4	-	-	-
Fungi in Immunocompromised	25	7	1	1
AFB in Immunocompromised	35	10	-	4
Fungi, Viral Change in BAL	16	3	-	-
Bacteria/Fungi in CSF	23	1	-	-
Unexpected Benignity	26	4	2	3
Disagreement between Primary and secondary pathologist	37	6	-	2
Disagreement between immediate and final FNAC	35	4	-	1
Unexpected Malignancies	35	4	-	1

The **Best mode of communication** was surveyed, clinicians rated mobile calls (n=42) 84%, SMS (n=6) 12%, Email (n=1) 2%, Extension number (n=1) 2%.

**Figure 1:** Enumerates the Best mode of communication among the clinicians

DISCUSSION

From our study overall number of critical alerts given were low but not uncommon accounting for 58 out of 23000 cytology reports. Most common among these are acid fast bacilli (n=26) 44.8% in Immuno compromised persons. Second most common was unexpected malignancy (n=23) 39.6%. Inflammation in synovial Fluid was (n=6) 10.4% and in CSF (n=3) 5.2%. From the survey done among the clinicians about the utility of critical alert values most of them rated for category 4 i.e. Stat phone call needed – prompt therapy is essential. Majority of them felt that AFB in Immuno compromised (n=35) and unexpected malignancies (n=35) had to be immediately informed. 2nd most common which was rated essential for treatment was significant disagreement between pathologists (n=34). Herpes in pap smear (n=4) and fungi in Immuno compromised had to be called for immediately. Notification and documentation is very essential for Critical Value's in cytopathology. In the survey among the clinicians on the best mode of communication clinicians rated mobile calls (n=42) 84%, If not reached by phone call many clinicians agreed for an SMS (n=6) 12%, which would alert them; they would be aware of the information. Other ways of communication which the clinicians opted were Email (n=1) 2% and

calling the landline Extension number (n= 1) 2%. Based on the survey clinicians seemed particularly concerned about infectious diseases. Timely communications with mobile phones is a better tool for early intervention. In the year 2003, American college of Pathologists published the Q-probe study, they assessed the physicians satisfaction with amount of pathology Lab Score, those with lowest satisfaction score were related to poor communication and notification of results.⁴ The need for a better communication in cytopathology and increase patient safety has been receiving special attention. Currently Critical alerts in cytology are monitored and managed based on personal experience and common sense as there are no established guidelines.⁽⁵⁾ In order to improve the quality of health care delivery an effective communication between clinician and pathologists is very essential.

CONCLUSION

It is very essential to outline important elements that help in operational success of critical diagnosis in cytology.^{6,7}

- Defining the critical value in cytology is the first step in the process. Clinicians should be involved

- in this process as their input is directly related to its usefulness.
2. There should be effective communication between pathologists and clinicians for better outcome of the patient.
 3. Critical value notifications should be documented in a timely manner.
 4. Periodic review should be held for continuous improvement.

Inevitably, success of critical value diagnosis in cytopathology is a multifactorial process. Critical diagnosis is effective when there is timely communication, timely treatment and better patient outcome.

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