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BLOOD SMEAR SCAN IN LOW PLATELET COUNTS- WHAT DO WE GAIN? – PATHOLOGIST'S PERSPECTIVE

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ABSTRACT

When the hematology analyzer gives a low platelet count, peripheral smear screening is often conducted by a Hemato morphologist for manual platelet estimate to counter check the analyzer's report. Such a smear screening process is often considered as an additional burden. This prospective study was conducted to analyze whether it is worthwhile to attach emphasis on such platelet 'scans' in low platelet counts.

KEY WORDS: Peripheral smear screening, Low platelet counts, Manual Platelet estimate
Abbreviations: MP/MF: Malarial parasite/Microfilaria

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INTRODUCTION

A 'Blood smear scan' is one which is done to counter check the automated platelet count, when the result is flagged by the analyzer or if it is below the critical value defined by the laboratory [1]. Laboratory accreditation agencies (Professional accreditation agencies) mandate such peripheral smear screening by a Hemato morphologist/Trained technician for all low platelet counts [2,3]. But, this exercise is usually considered tedious; when a smear study report is not asked for, the screening is done superficially, to vouch or counter check the analyzer values. This study was conducted to assess the role of blood smear scans in adding value to the hematology reports.

MATERIALS AND METHODS

The study was approved by institutional ethical and research committee. A prospective study was conducted in the hematology laboratory of a tertiary care hospital during the period of January to May 2013. Complete Blood count was carried out using Sysmex KX-21 fully automated hematology analyzer. For analyzer platelet counts less than $100X10^9$ /L with or without flagging, blood smears were prepared and stained with Leishman's stain. Those cases with low platelet counts, but with a smear study request or with a request of smear for MP/MF or malarial parasite positive cases in QBC were excluded from the study. With basic details and CBC report of the patient in hand, the smears were viewed by a trained Hemato morphologist. Ten fields were viewed under 10X and then hundred fields under 100X (oil immersion) using Olympus CH21i microscope [4]. Recorded findings were then tabulated and analyzed.

RESULTS

A total of 964 smears was included in the study and the details are tabulated in table 1. Forty three smears (4%) were found to have normal platelet counts. Rest of the smears showed low platelet counts. Platelet estimates in about 72% of cases were low without any other identifiable abnormalities in the smear. Twenty percent of the smears showed the presence of malarial parasites (Plasmodium vivax or Falciparum); About 3% of smears showed pancytopenia with or without features of other lineage abnormalities.

TABLE 1
Details of the blood smear scan (platelet scan)

Serial No.	No. of Smears (Percentage)	Finding
1.	694 (71.9%)	Isolated thrombocytopenia
2.	195 (20.1%)	Thrombocytopenia with Smears positive for Malaria Parasite
3.	43 (4%)	Normal Platelet estimate (with clumps)
4.	22 (2%)	Pancytopenia with cause unknown
5.	09 (0.9%)	Pancytopenia with Blast cells in the smear
6.	01 (0.1%)	Pancytopenia with macrocytic anemia
TOTAL	964	

DISCUSSION

Four percent of the analyzer reported low platelet counts had normal platelet counts in the peripheral smear. Many (31 cases) of them showed giant platelets (admixed with normal sized platelets) which would have been counted as a WBC by the analyser[5]; Rest (12 cases) showed plenty of platelet clumps which is usually due to inadequate mixing. This issue needs to be addressed because effective preanalytical measures in the form of adequate sample mixing using vortex mixer can reduce such errors to a great extent [6]. Seventy two percent of the cases had isolated low platelet estimates and this could be attributed to various reasons immune or non immune[7]. A small percentage of

smears showed pancytopenia out of which nine cases were with Leukemic blast cells and one with a macrocytic anemia. Twenty percent of the smears showed an incidental finding of the presence of malarial parasite. Trophozoite, schizont forms or gametocytes of P.vivax or P.falciparum were made out. Though the sensitivity of thin blood smears is the lowest among the various methods available for detection of malaria parasite[8,9], in endemic areas with high parasite index, screening of thin blood smears is still found to be quite useful. Laboratory-clinical interface is better bridged by interpretative comments[10,11]. And so, inclusion of additional observations like presence of giant platelets, malarial parasite with species, forms and parasite index, blast cells or macrocytic RBCs in all thrombocytopenic reports, will contribute to increase the quality of hematology reports.

CONCLUSION

In our study, we found out that a routine platelet screening procedure can add value to the routine CBC report, which might reduce the burden of physicians in order to not miss clinically significant findings. Furthermore, it also implies indirectly, for continuous improvement of laboratory procedures with increased focus on pre and post analytical procedures.

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