

Performance evaluation of
hematology analyzer SYSMEX
KX-21 for
PLATELET AND WBC COUNT

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AIMS AND OBJECTIVES

To evaluate the performance of Sysmex KX-21 for the estimation of Platelets and WBC count in comparison with microscopy

STUDY DESIGN

- Comparative analytical cross sectional study
- Pathology Department Allama Iqbal Medical College, Lahore.
- Duration: 7th Oct 2009 to 6th Nov 2009

MATERIALS AND METHODS

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Sample Selection:

- Routine Samples received from Medicines, Oncology and Pediatrics wards
- Samples taken in EDTA Vacutainers
- Analyzed within 4 hours of collection

MATERIALS AND METHODS

Equipment:

- CBC performed using Sysmex KX-21, that was maintained and calibrated as recommended by the manufacturer
- Quality Control was maintained by running controls daily and maintaining Levey-Jenings Chart.
- Air dried blood smears made, stained by Giemsa stain and examined under Microscope

MATERIALS AND METHODS

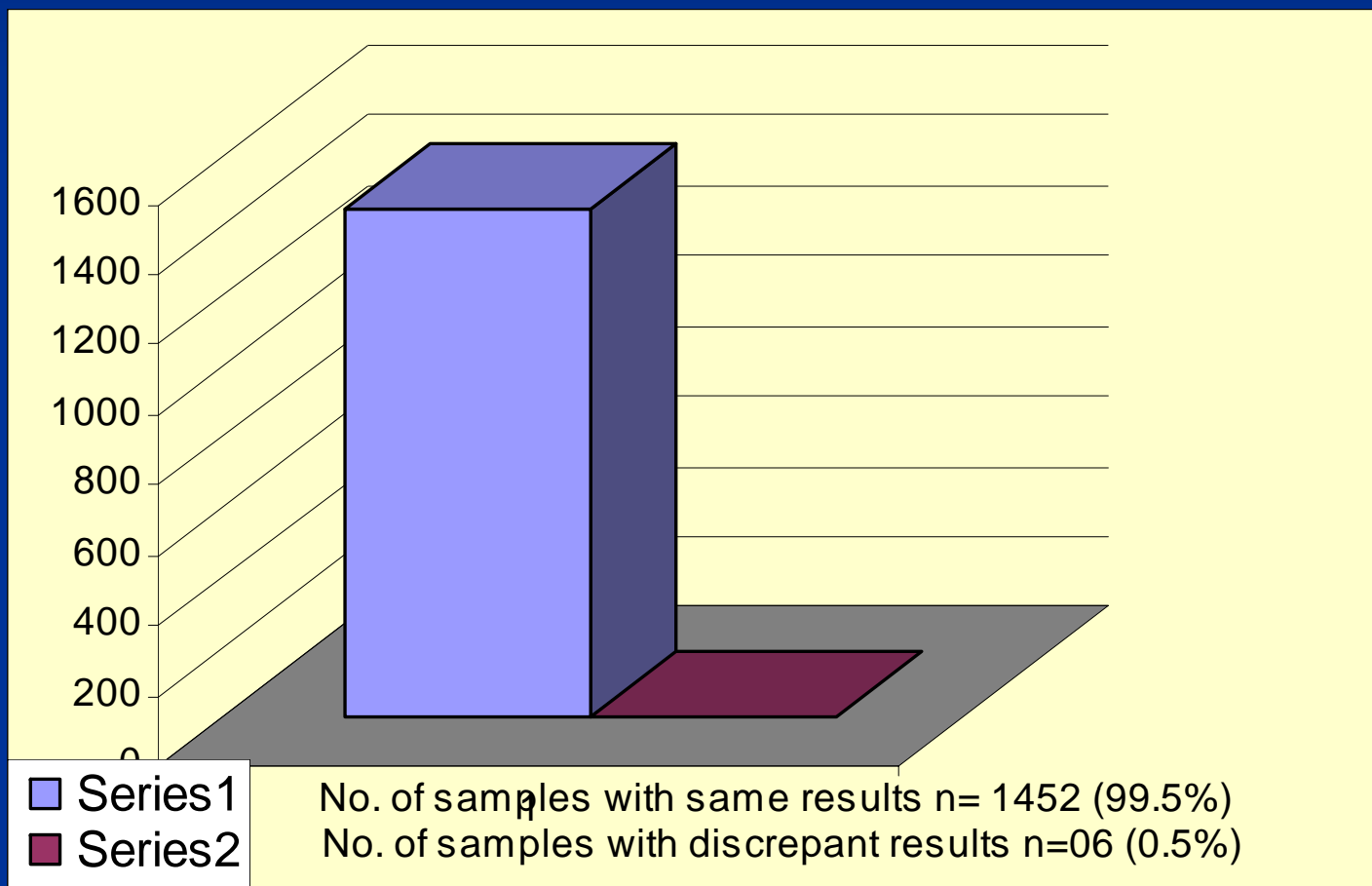
- Manual WBC Count was done by calculating estimation factor and then multiplying this estimation factor with average manual WBC Count per field.
- Manual Platelet Count was done by counting no. of Platelets in 10 successive high power fields, calculating their average and multiplying it by 10^9

RESULTS

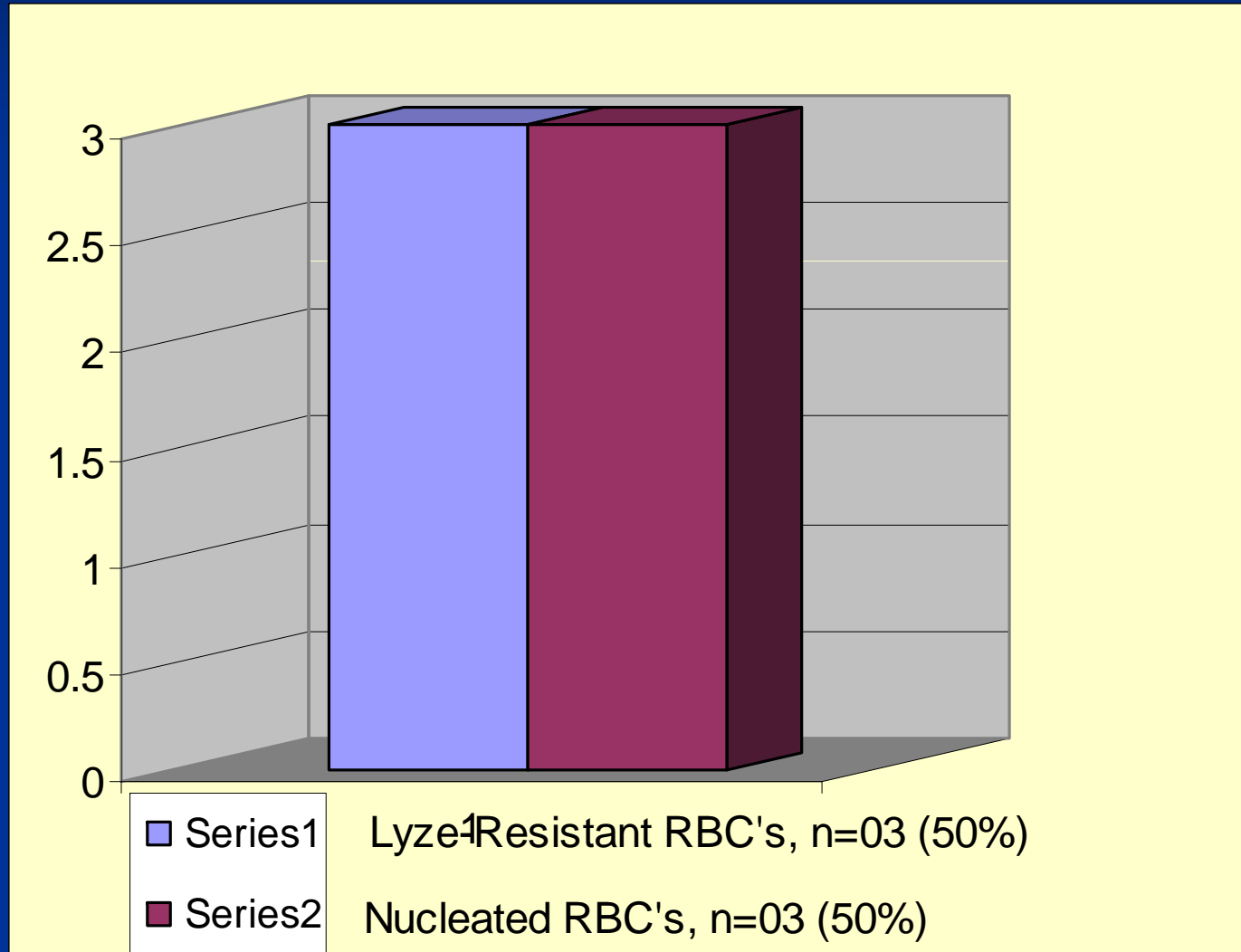
RESULTS

- Total Samples Received: 1500
- Samples Processed: 1458
- Samples Rejected: 42

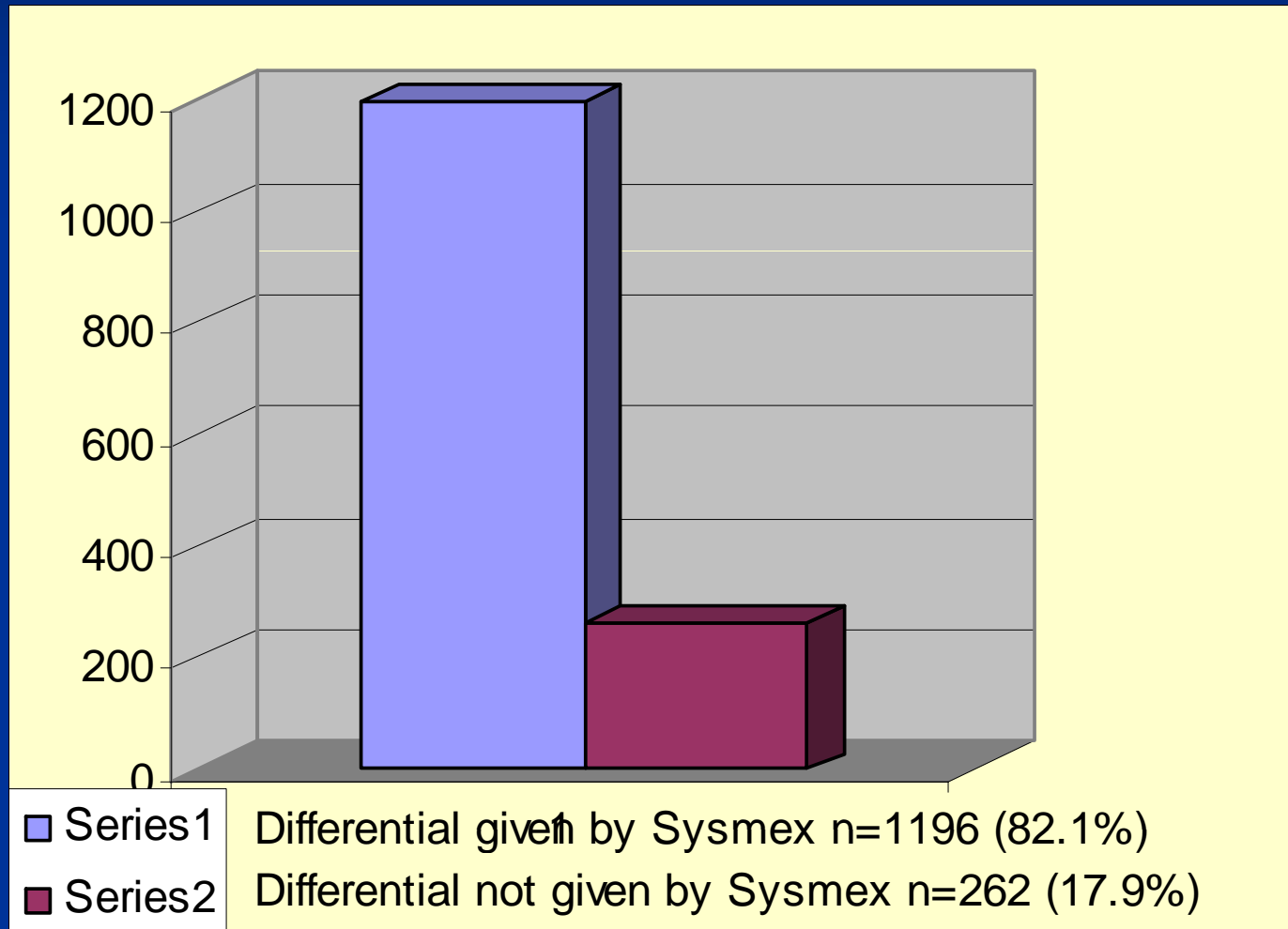
WBC COUNT ESTIMATION



REASONS FOR DISCREPANT RESULTS



DIFFERENTIAL COUNT BY SYSMEX



**TABLE NO 1: CORRELATION OF DIFFERENTIAL
COUNT
BETWEEN SYSMEX AND SMEAR**

Total No. of Differential Given by Sysmex	<u>No. of Smears correlating with Sysmex</u>	<u>No. of Smears not correlating with Sysmex</u>
1196	1186 (99.1%)	10 (0.9%)

TABLE: 2 CAUSES OF MISSING DIFFERENTIAL COUNTS

Total Samples	Low WBC Count	Low WBC Count with Abnormal cells	Normal WBC Count with Abnormal cells	High WBC Count with Abnormal cells	Old Samples
262	122 (46.5%)	09 (3.4%)	38 (14.5%)	68 (25.9%)	25 (9.5%)

PLATELET COUNT ESTIMATION

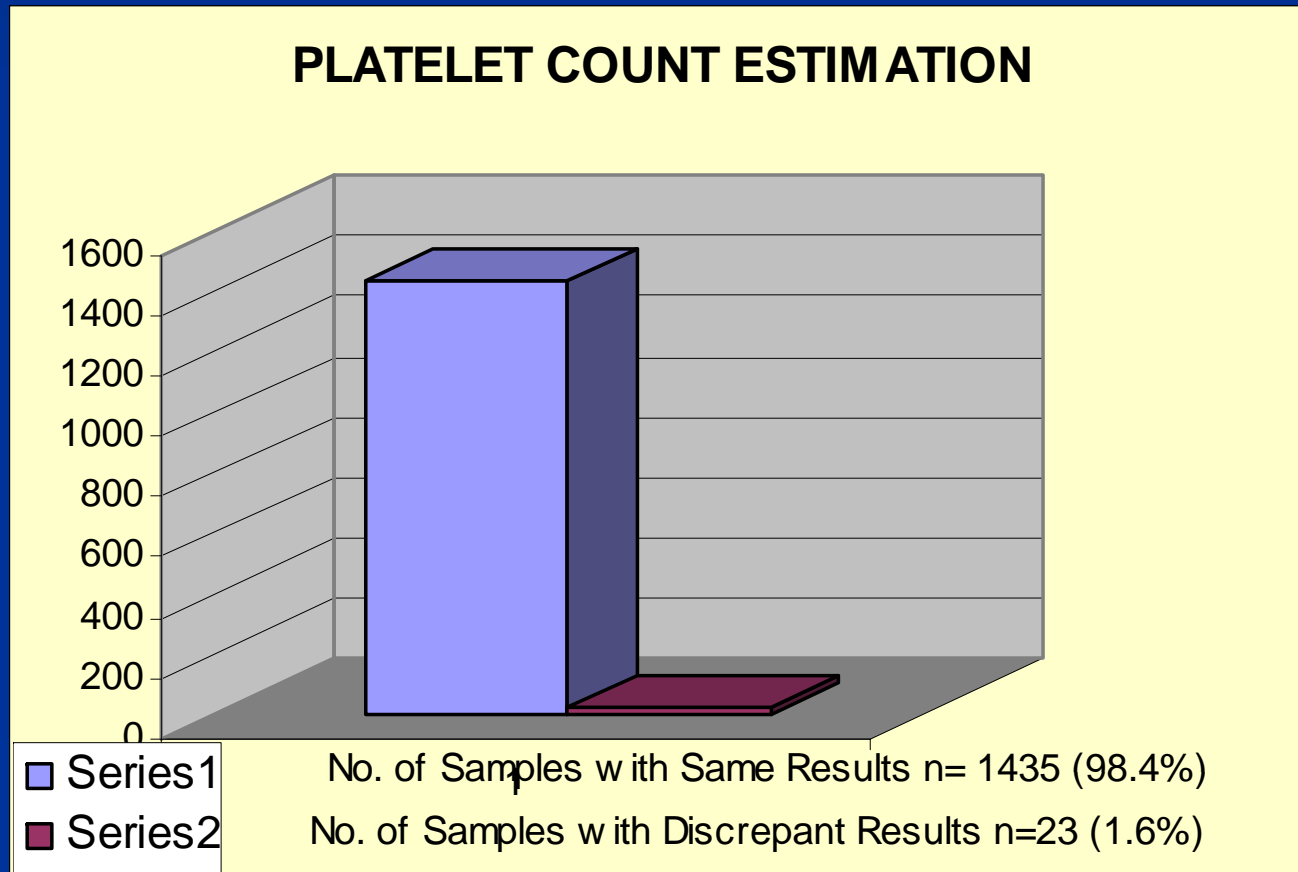


TABLE NO: 3 CAUSES OF DISCREPANCY IN PLATELET COUNT

Total Samples	Platelet Clumping	Fragmented RBCs
23	17 (73.9%)	06 (26.1%)

DISCUSSION

DISCUSSION

- In WBC Count estimation, 99.5% samples correlated well with manual WBC Count.
- 0.5 % of Samples showed discrepant results indicated by respective flags on Sysmex
- **Lennet et al** described that, correlation between automated flagged and manual results was excellent

DISCUSSION

- Differential count given by Sysmex KX-21 also showed very good correlation (99.1%) with the manually done differential
- **Ken et al** showed a strong correlation of DM96 and manual methods with the Sysmex data for the neutrophil, lymphocyte and eosinophil count.

DISCUSSION

- 17.9% samples missed differential due to markedly low WBC Count and also due to the presence of abnormal cells, again indicated by the flagging system.
- **Martin S.** described that these analyzers are still inferior to manual techniques as far as reliability and ability to discover abnormal cells is concerned.

DISCUSSION

- Platelet count of 98.4% samples correlated with the peripheral smear.
- 1.6% samples showed discrepant results due to platelet clumps and fragmented RBCs (Indicated by respective flags)
- **Molok et al** described that manually done platelet count showed no statistical difference in mean from the automated platelet count except for those samples that showed flags on Sysmex

CONCLUSIONS

- Sysmex KX-21 is a reliable automated analyzer for total WBC Count, its differential and Platelet count, but for the automation to be effective results of the controls should be precise and accurate
- Verification by peripheral smear is required only for those samples that are indicated by flagging.

THANK YOU