DEVELOPING INTERNAL REFERENCE RANGE FOR DIHYDRORHODAMINE (DHR) TEST: A RETROSPECTIVE ANALYSIS FROM TWO CENTRES IN MALAYSIA

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Background

The diagnostic laboratory assessment for chronic granulomatous disease (CGD) includes evaluation of NADPH oxidase function in neutrophils, using the more analytically sensitive DHR test. Due to the lack of normal reference range of DHR test in Malaysia, the study aimed to create an internal reference which will be more accurate and helps in the disease interpretation and management.

Purpose:

To develop an internal reference range by determining the relative proportion of oxidizing cells (%), mean fluorescence intensity (MFI) and to categorize disease manifestations from clinical record.

Methods:

A retrospective analysis was conducted from 107 individuals who were referred for the DHR test from AMDI and HUSM. Logistic regression was used to determine the relationship between study groups and the parameters. Finally, the cut point of the parameter was determined by Receiver Operating Characteristic (ROC). The clinical information (presenting feature, causative microorganisms, diagnosis), socio-demographics (age, sex, and ethnicity), and the clinical diagnosis were analyzed to determine the type of infection and their relations to the DHR+ results.

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Results:

The optimum cut-point: (i) AMDI

	Cut-point	Sensitivity	Specificity	AUC
fMLP%	0.26 %	0.80	0.00	0.91
fMLP MFI	9.15	0.95	0.33	0.67
PMA %	58.70 %	1.00	0.00	1.00
PMA MFI	50.00	0.83	0.00	0.94

(ii) HUSM

	Cut-point	Sensitivity	Specificity	AUC
fMLP%	3.86 %	0.17	0.00	0.16
fMLP MFI	999.50	0.83	0.00	0.89
PMA %	45.69 %	1.00	0.00	1.00
PMA MFI	1130.50	1.00	0.00	1.00

From our demographic data from AMDI, mumps, urinary tract infection, left pleural collection secondary to abscess, sepsis, fever, pneumonia, and perianal abscess were the commonest clinical presentation in individuals with abnormal DHR result. We also found the most common isolated organisms from CGD patient's culture were *Aspergillus fumigatus*, *Escherichia coli*, *Klebsiella pneumoniae* and *Proteus mirabilis*.

Conclusion:

This study confirmed that there was a difference between the two centers in terms of test results and cut-point. We have suggested two cut-point values to be used in their respective lab as a reference range. It is also recommended that both centers revisit and revise their reference range by conducting the same analytical method but using a larger sample size in the future to get more accurate cut-points.

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