C Reactive protein and total leukocyte count as a marker for the screening of early sepsis

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Introduction

🔲 Antibiotic Resistance is a major healthcare problem worldwide

🔲 Blind therapy is considered to be the most common reason for antibiotic resistance

🔲 Unavailability of lab results before prescription and triage

Need For Study

Source: WHO
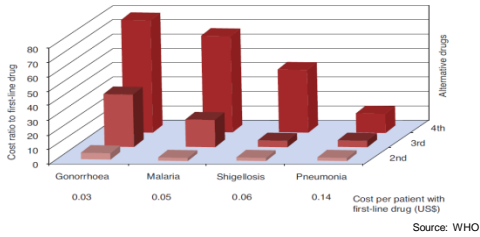
Aim & Objectives

🔲 The aim of the study was to evaluate the usefulness of C-Reactive protein and total leukocyte count alone or coupled together as early diagnostic markers of bacterial infections among hospitalised patients

Material and Methods

🔲 Five hundred and twenty one patients presenting with signs and symptoms of any local infection or sepsis were included in the study

🔲 Patients on any antibiotic therapy were excluded from the study

🔲 Samples were collected from all the patients for various investigations : Complete haemogram, ESR, C reactive protein and for culture sensitivity examination

🔲 All patients underwent detailed evaluation and following the reports of the culture examinations the patients were divided into two groups as culture positive and Culture negative

Statistical Analysis

Data Presentation:
- 🔲 Continuous Variable: Mean± SD
- 🔲 Categorical Variable: Frequency and Percentage

Data Analysis:
- 🔲 Comparison between groups
- 🔲 Categorical variable: Chi-Square test/ Fischer-Exact test
- 🔲 Continuous variable: Student t test/ Wilcoxon rank-sum test

ROC Curve analysis
- 🔲 To determine the diagnostic utility of test for diagnosis of infections

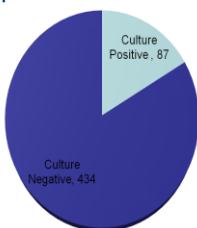**Significance p <0.05**

Results

Figure 1: Study Population

Table 1: Demographic parameters of the study population

Parameter	Culture Positive (n = 87)	Culture Negative (n = 434)	P value
Age*	38.3±18.09	34.8±13.06	0.96
Sex†	Males: 54 (62) Females: 33 (38)	Males: 318 (73) Females: 116 (27)	0.48

Values expressed as * mean± SD and † n(%)

Table 2: Haematologic parameters among the two groups

Parameter	Culture Positive (n = 87)	Culture Negative (n = 434)	P value
Hb	9.6±2.3	11.2±3.2	0.03
MCV	82.9±11.57	90.7±17.5	0.001
MCH	28.7±6.6	31.5±7.0	0.0002
MCHC	34.01±1.66	34.25±3.88	0.56
RBC	3.55±0.98	3.71±0.57	0.24
Platelet	327.5±187	199±99.8	< 0.001

Values expressed as mean± SD

Table 3: CRP and Leucoyte count among the study Population

Parameters	Culture Positive	Culture Negative	P value
TLC	22.6(4.6-74.2)	6.2 (1.2-42.0)	< 0.001
CRP	17.6 (4.1-74.1)	1.3 (0.2-40)	<0.001
Platelet	296 (11-899)	192 (20-560)	<0.001
Granulocytes	78 (54- 92)	62 (36-81)	0.03
Lymphocytes	21 (06-42)	46 (16-51)	< 0.001

Values expressed as Median (Min-Max.)
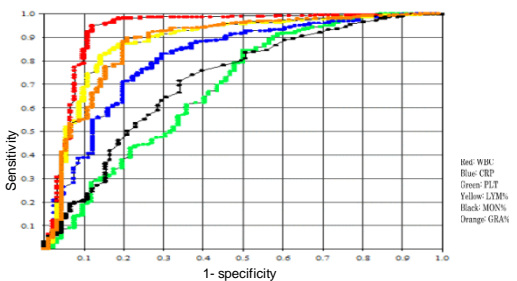
Fig 2: ROC Curve for various parameters

Red: WBC
Blue: CRP
Green: PLT
Yellow: LYM%
Black: MON%
Orange: GRA%

1- specificity

Table 4: Area under curve value for various parameters

	CRP	WBC	GRA%	LYM%	MON%	PLT	WBC CRP
AUC	0.85	0.95	0.87	0.88	0.72	0.69	0.98

Conclusion

🔲 WBC counts and C Reactive protein together constitute a Rapid and affordable tool for the diagnosis of bacterial infections before the culture results are available

🔲 Differentiation between bacterial infection and non bacterial infection or inflammatory response could help in judicious use of antibiotic treatment