

Significantly higher procalcitonin levels could differentiate Gram negative bacteremia from Gram positive and fungemia.

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BACKGROUND

Procalcitonin (PCT) levels can distinguish between bacteremia and non-infectious inflammatory states in critically ill patients. However, there are some differences between Gram negative (G-), Gram positive (G+) and fungal bloodstream infections, particularly in different cytokine profiles, severity and mortality. Can PCT levels be a distinguishing mark between G+, G- bacteremia and fungaemia as well?

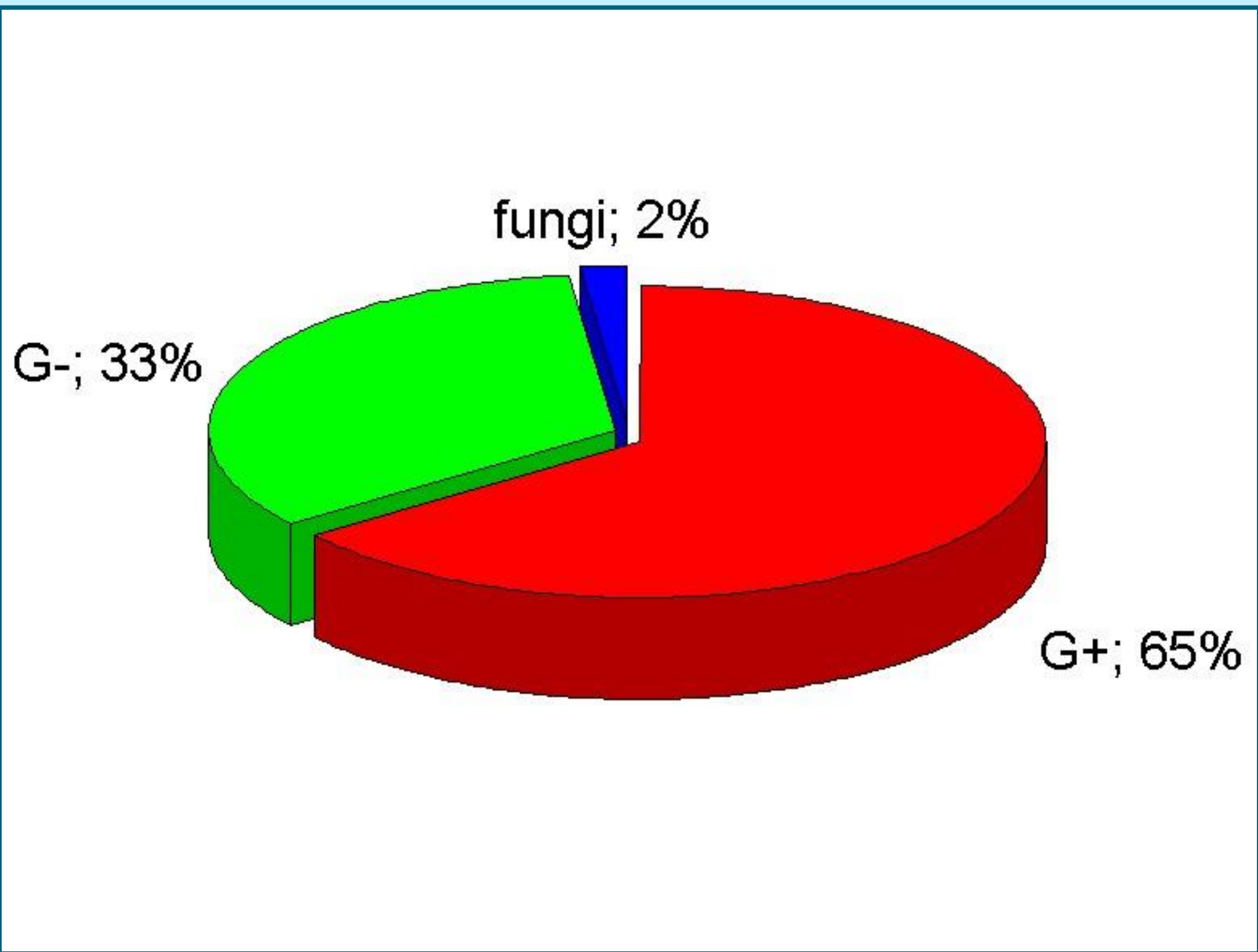
MATERIALS AND METHODS

We have enrolled 275 samples from 180 septic patients with positive haemocultures. Sera from the date of blood-culture evaluation were examined on C-reactive protein (CRP) and PCT concentrations. The median (IQR) of CRP and PCT in G+, G- and fungal cohorts, and a comparison of measured values between groups was made using the Kruskal-Wallis test, with $p < 0.05$.

RESULTS (1)

In 178/275 (65%) of haemocultures, G+ microbes were detected; 92/275 (33%) were G-rods, and 5/275 (2%) were fungi, see Figure 1.

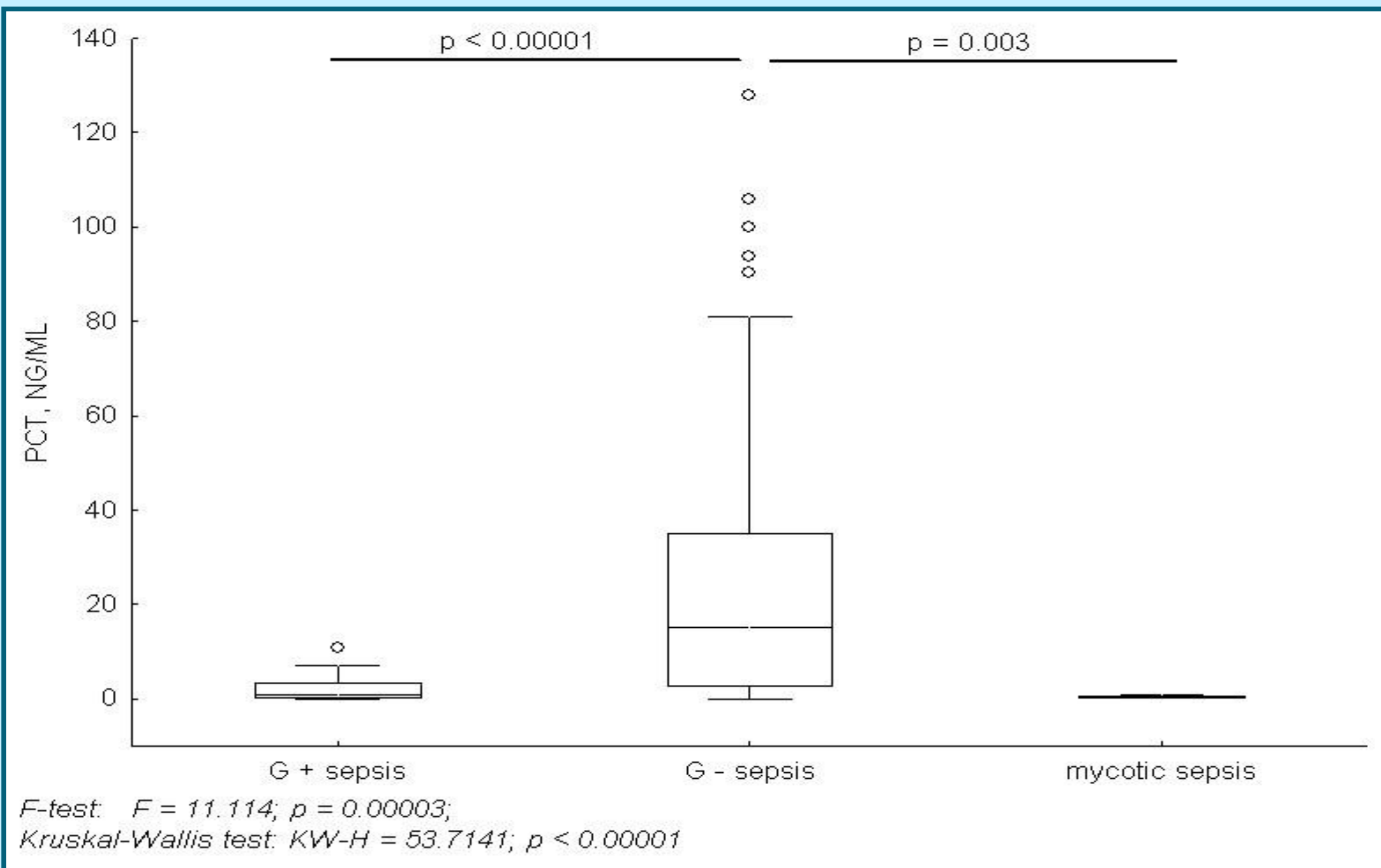
Figure 1 Microbial findings in haemocultures



RESULTS (2)

PCT concentrations were significantly higher in G- compared to other cohorts: 8.90 (1.88; 32.60) in G-, 0.81 (0.32; 3.50) in G+, and 0.58 (0.35; 0.73) in fungi ($p < 0.00001$), see Figure 2.

Figure 2 PCT concentrations in different cohorts according to haemoculture results



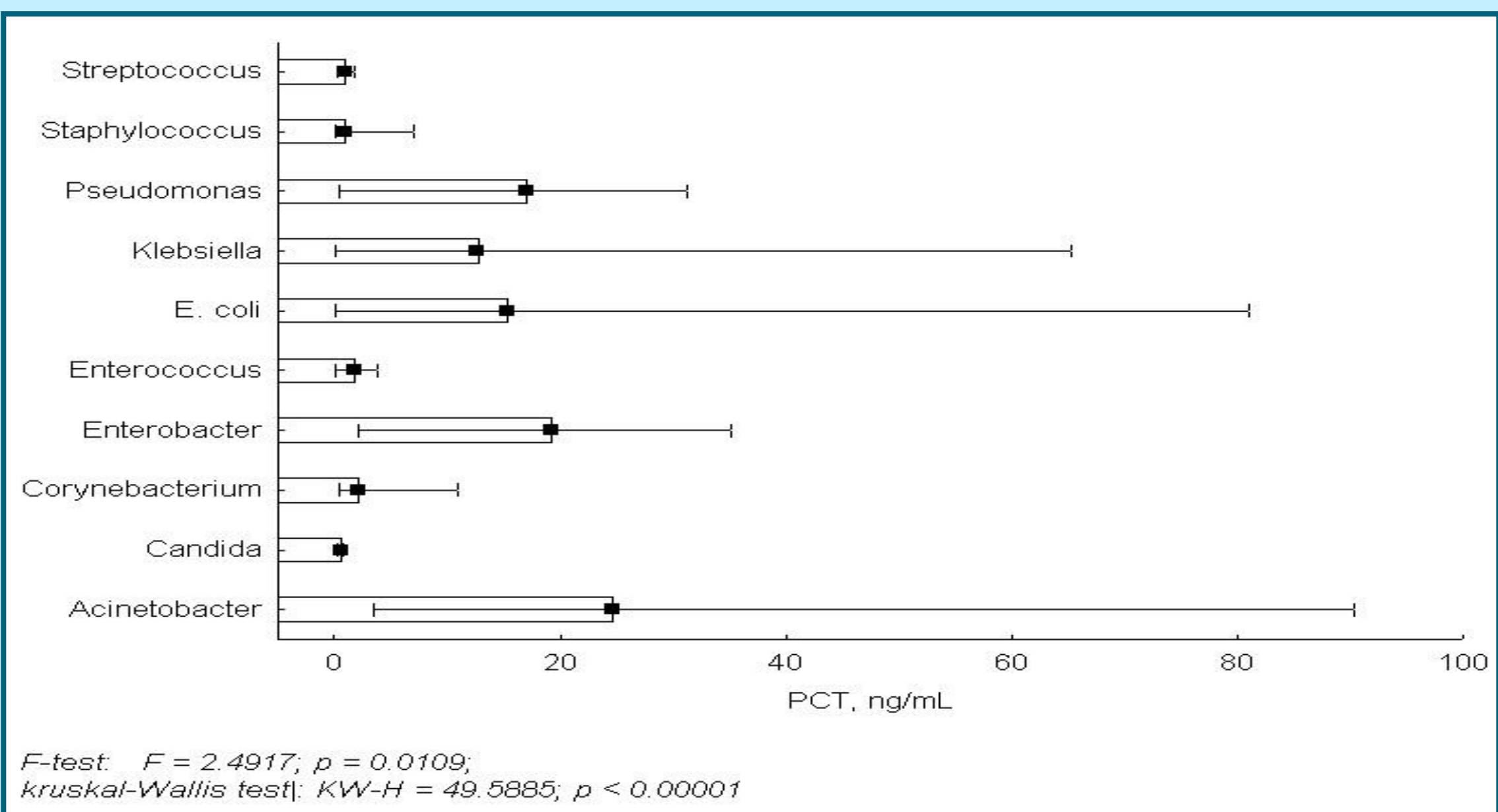
CRP concentrations did not differ significantly in groups, see Table 1.

Table 1 CRP and PCT in different cohorts of patients

	CRP, mg/L		PCT, ng/mL	
	Median (IQR)	P-value	Median (IQR)	P-value
G + sepsis	119.00 (69.80;219.00)	0.92; NS	0.81 (0.32;3.50)	$p < 0.00001$
G - sepsis	129.90 (87;210)		8.90 (1.88;32.60)	
mycotic	149 (128;152)		0.58 (0.35;0.73)	

The highest PCT levels were found in patients with E. coli, Klebsiella and Pseudomonas in blood-cultures; whereas Candida, Streptococcus and Staphylococcus were linked with a mild PCT elevation, see Figure 3.

Figure 3 PCT concentrations in different bacterial species



RESULTS (3)

In patients with PCT < 10 ng/mL, G+ haemocultures predominated (68%); whereas a group with PCT > 10 ng/mL was formed mainly (79%) from G- microbes, see Figures 4 and 5.

Figure 4 Haemoculture results versus an extent of PCT elevation

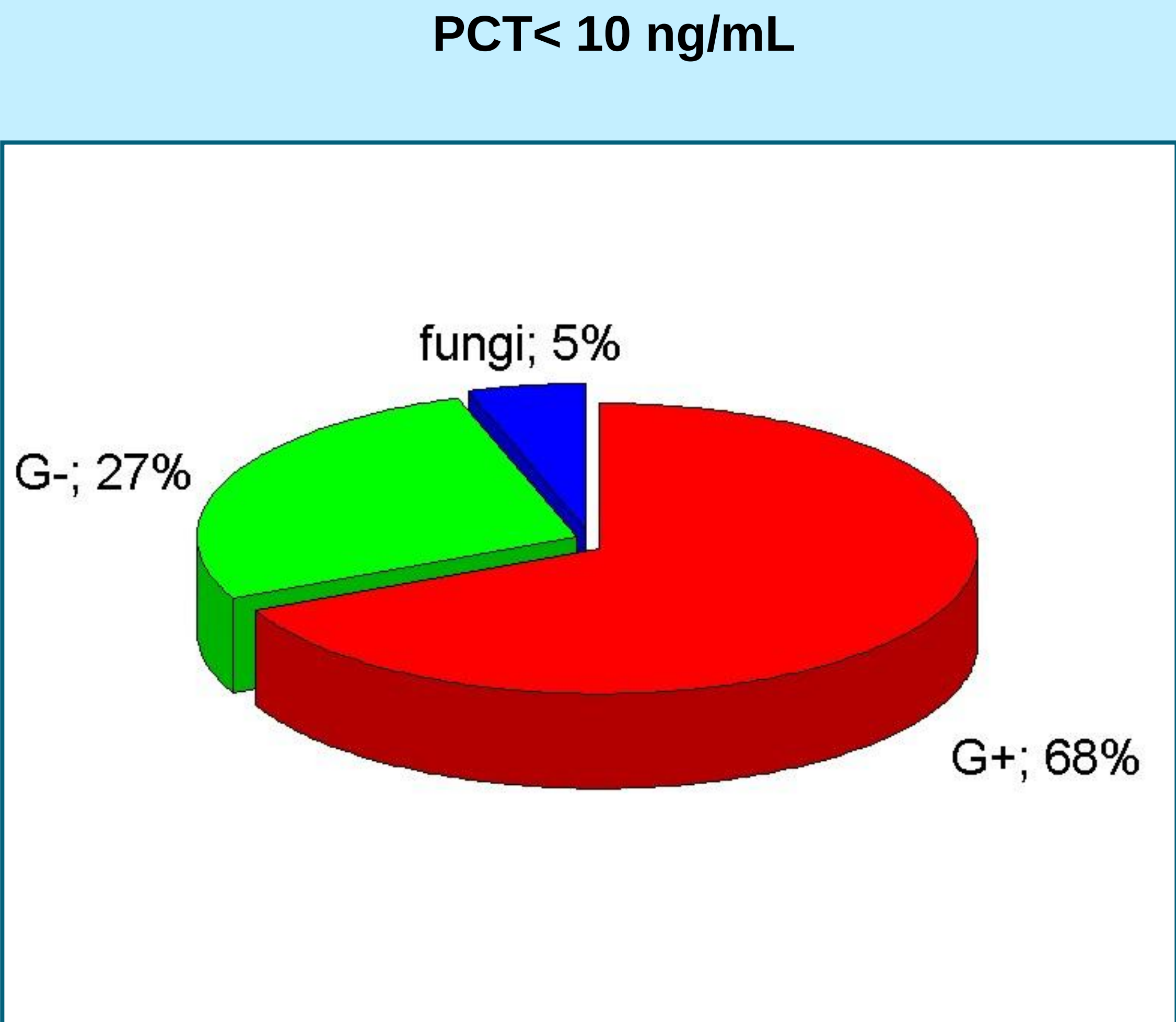
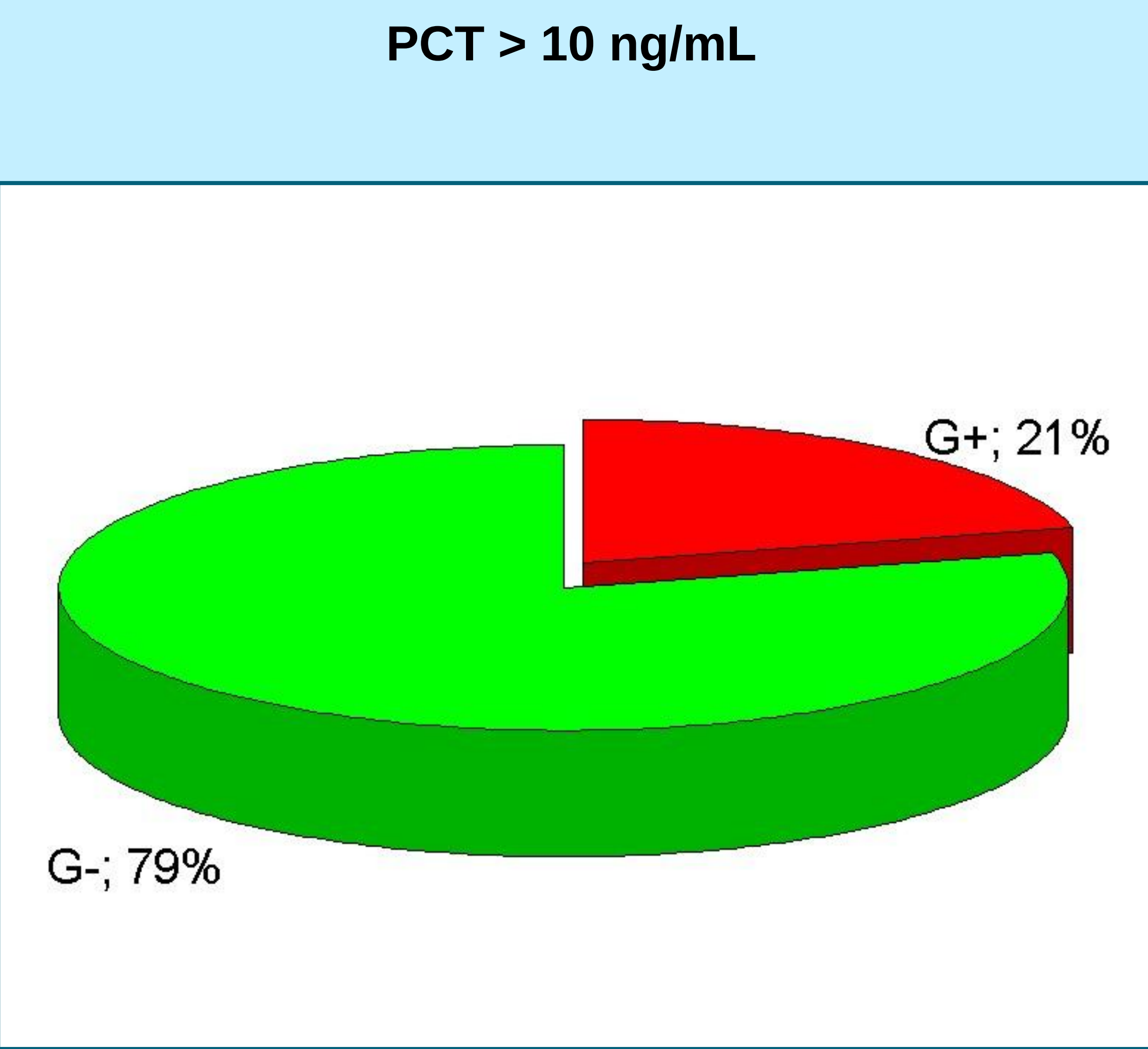


Figure 5 Haemoculture results versus an extent of PCT elevation



CONCLUSIONS

Significantly higher PCT levels could differentiate G- bacteremia from G+ and fungaemia. In contrast to CRP, PCT is a good discriminative biomarker in different bloodstream infections.

ACKNOWLEDGEMENT

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