

ABSTRACT

Background: Severe sepsis and septic shock are life threatening conditions affecting all age groups. Procalcitonin (PCT) is a serum marker to determine the presence of a serious bacterial infection and to guide antibiotic therapy. Its routine use in pediatric age group remains unclear.

Objective: To assess whether lower level of PCT was associated with decreased length of stay (LOS) and decreased use of antibiotics in children and adolescents aged 2 months to 21 years.

Design/Methods: Retrospective chart review of all children and adolescents aged 2 months to 21 yrs admitted to Jamaica Hospital Medical Center from August 2017 to August 2018 with fever >100.4 F and PCT drawn. Exclusion criteria included immunodeficiencies, oncological, autoimmune and rheumatological conditions and respiratory distress. Data collected included demographics (age, gender, ethnicity), vital signs, PCT level, C-reactive protein (CRP), WBC count, platelet count and culture results at the time of acute febrile illness, duration of antibiotic use and length of stay (LOS). Group 1 (G1) included patients with PCT <0.5 ng/ml and Group 2 (G2) included patients with PCT >0.5 ng/ml. Data were analyzed using GraphPad Prism, percentages, student t-test, Mann-Whitney U test and chi-square. P<0.05 was considered significant.

Results: Of 100 charts reviewed, 35 met exclusion criteria. Of remaining 65, there were 31 in G1 and 34 in G2. 58% of children in G1 were males compared to 82% in G2. 45% vs 38% were Hispanic. Median G1 and G2 were compared. There was statistically significant difference between G1 vs G2 in median age 6 2/12 years vs 2 3/12 years, p=0.0002, heart rate (HR) Z-score adjusted for age 1.78 vs 3.23, p=0.0052, median temperature 101.8F vs 103.0F, p=0.0156 and median CRP 3.6 vs 5.9, p=0.017. We confirmed statistically significant difference in median days of antibiotics in G1 2.8 vs G2 8.0 days, p=0.03. There was no significant difference in WBC count, platelet count, culture reports and LOS.

Conclusions: In our small sample, PCT <0.5 ng/ml was associated with decreased need for antibiotic use while LOS was not affected. PCT appears to be a useful tool guiding clinician to delay antibiotic use in children older than 2 months of age.

INTRODUCTION

- Severe sepsis and septic shock are life threatening conditions affecting all age groups
- Diagnosing sepsis is challenging as blood cultures are often negative
- C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) assays are acute phase reactants detecting nonspecific inflammation
- Procalcitonin (PCT) is a serum marker determining the presence of a serious bacterial infection
- PCT may be used to guide antibiotic therapy and its routine use in Pediatrics is unclear

OBJECTIVE

To assess whether level of PCT < 0.5 ng/ml is associated with decreased length of stay (LOS) and decreased use of antibiotics in children and adolescents aged 2 months to 21 years

METHODS

- **Methods:** Retrospective chart review
- **IRB:** Approved by Jamaica Hospital Medical Center
- **Time Frame:** August 2017 to August 2018
- **Inclusion criteria:** Children and adolescents aged 2 months to 21 years with fever >100.4 F admitted to inpatient service with PCT level drawn
- **Exclusion criteria:** immunodeficiency, malignancy, autoimmune condition, rheumatologic condition, respiratory distress
- **Study Design:** Patients were divided in 2 groups:
 - **Group 1: PCT ≤ 0.5 ng/ml**
 - **Group 2: PCT > 0.5 ng/ml**
- **Statistical analyses:** Graphpad Prism 8, student t-test, Mann-Whitney U test, chi-square test
p < 0.05 was considered significant

RESULTS

- **Charts reviewed:** total 65
 - Group 1: n = 31
 - Group 2: n = 34
- **Demographics:** age, gender, ethnicity, Table 1
- **Clinical data:** HR Z score at time of sepsis, temperature at time of sepsis, figure 1
- **Laboratory data:** PCT, CRP, white blood cell count, platelet count, cultures (blood, urine, CSF), figure 2, Table 2
- **Outcomes:** duration of antibiotic use, length of stay, figure 3

Table 1: Demographics

Demographics	Group 1 (n=31)	Group 2 (n=34)
Age (median) years/months	6y 2mo	2y 3mo
Gender (males) %	58	82
Ethnicity (Hispanic) %	45	38

Figure 1: Clinical data

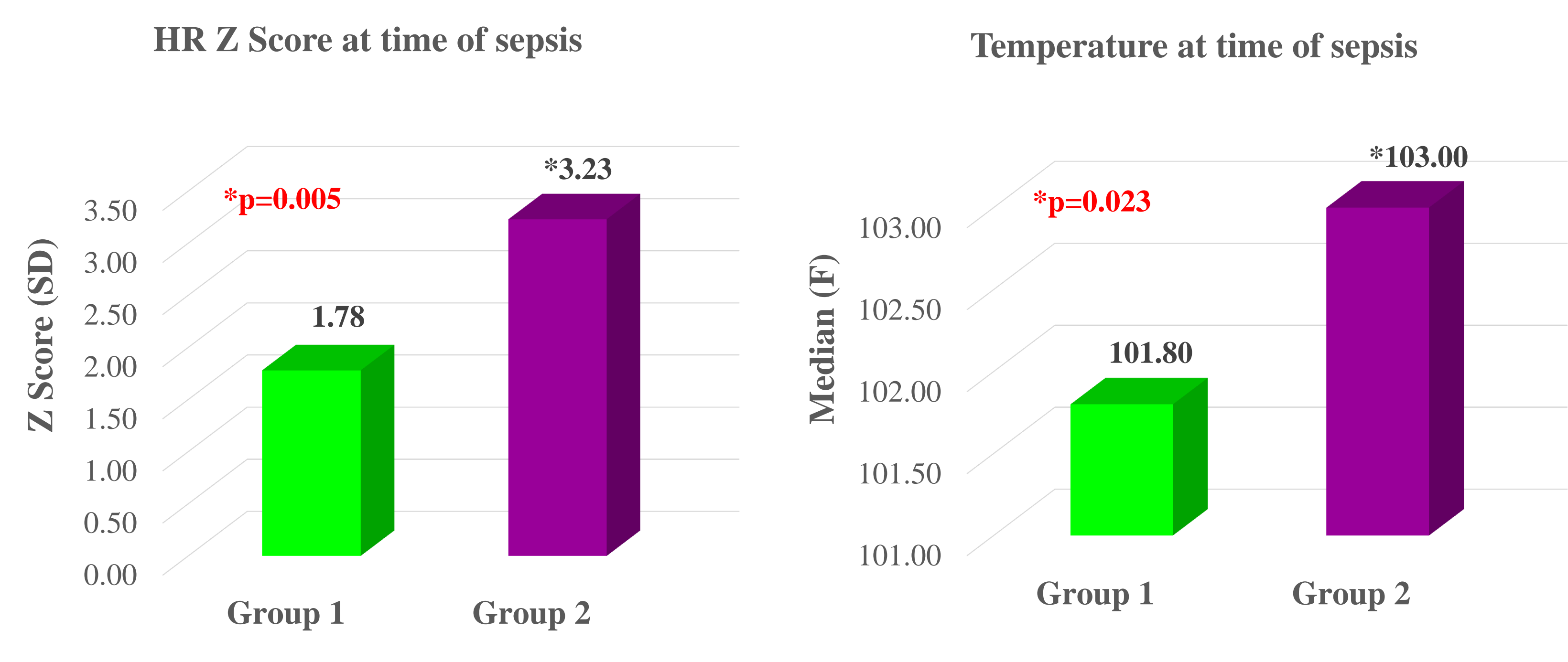


Figure 2: Laboratory Data

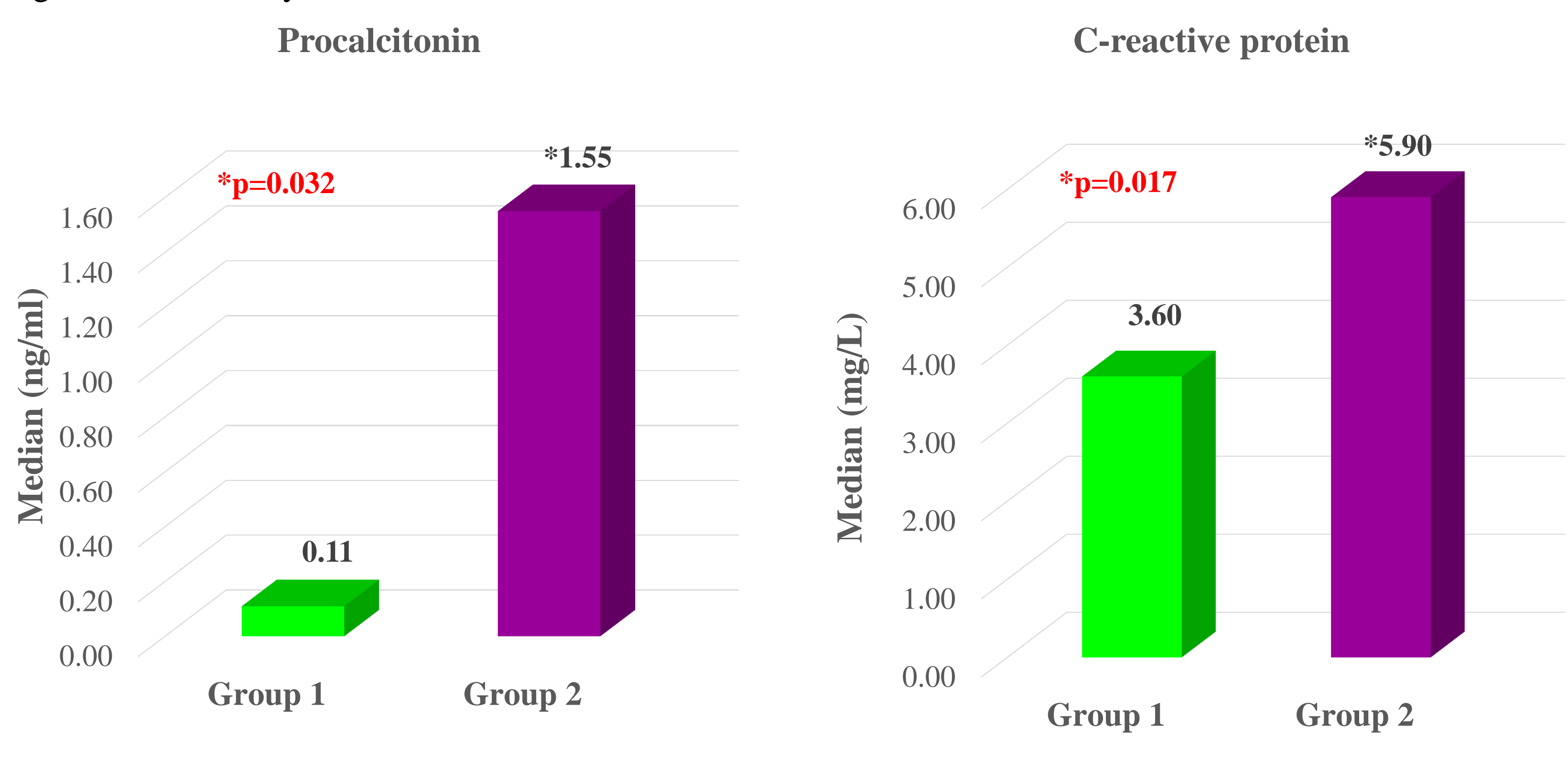
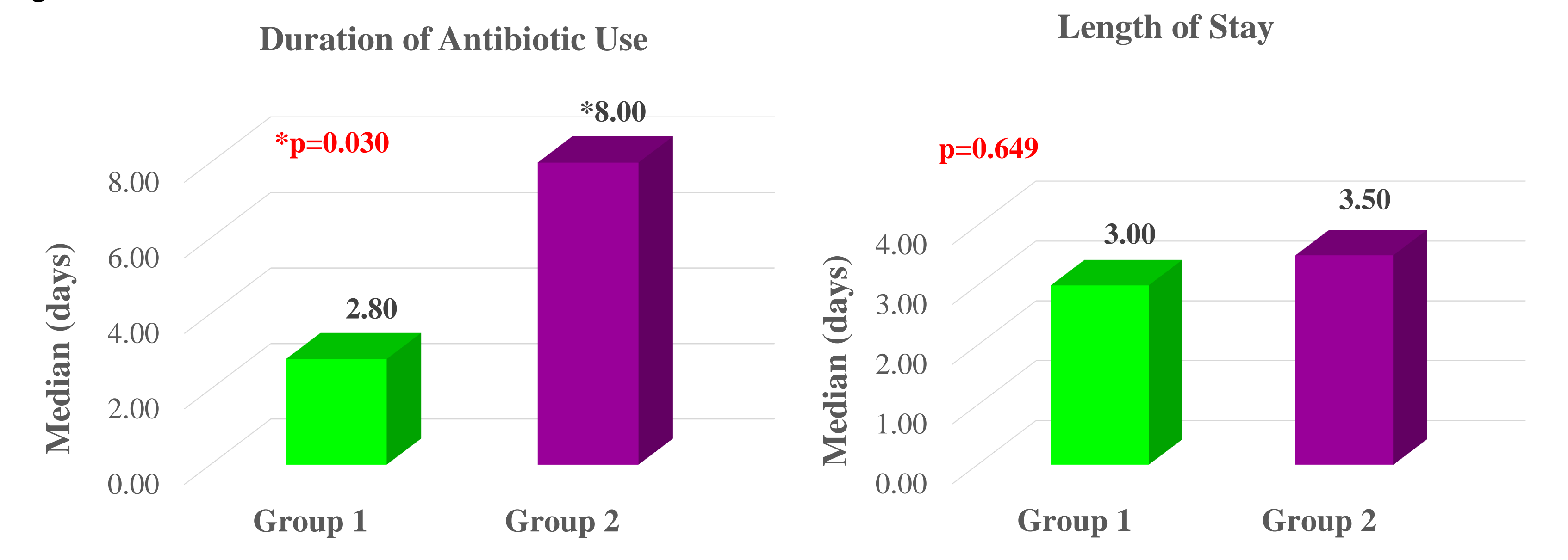


Table 2: Laboratory data

	Group 1 (n=31)	Group 2 (n=34)	p value
WBC > 20 k/uL (%)	4/31 (13)	12/34 (35)	0.158
Platelet Count (median) k/uL	314	336	0.180
Positive Blood Culture (%)	2/28 (7)	2/34 (5)	0.999
Positive Urine Culture (%)	1/20 (5)	0/25 (0)	0.457
Positive CSF Culture (%)	0/2 (0)	1/6 (16)	0.999

p < 0.05 was considered significant

Figure 3: Outcomes



CONCLUSIONS

- PCT < 0.5 ng/ml was associated with shorter duration of antibiotic use while LOS was not affected
- PCT can be a useful tool guiding clinician to delay antibiotic use in children older than 2 months of age

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