INTRODUCTION
Neonatal sepsis (NS) is the 2nd most common cause of neonatal deaths after prematurity in developing countries. Current neonatal mortality rate in Pakistan is 44 per 1000 live births. In developing countries like Pakistan, mortality related to neonatal sepsis is three times higher than developed world. NS is a systemic infection of new-borns <28 days of life, with a positive blood culture showing growth of bacteria. Data was analysed using SPSS V 25.0. Sensitivity, specificity, negative predictive value (NPV) and positive predictive value (PPV) of CRP was measured and compared in each group.

METHODOLOGY
A cross-sectional study was conducted at Neonatal Unit, Town Children Hospital, Peshawar, Khyber Pukhtunkhawa from August 2016 to February 2017. A total of 385 neonates from age 0 to 28 days with clinical features of neonatal sepsis were sampled using consecutive sampling technique. Two groups were identified, i.e. early onset neonatal sepsis (age <72 hours) and late onset neonatal sepsis (age >72 hours). Each neonate was sampled for blood culture and C-reactive protein (CRP). Diagnosis of neonatal sepsis was established through a positive blood culture. Data was analysed using SPSS V 25.0. Sensitivity, specificity, negative predictive value (NPV) and positive predictive value (PPV) of CRP was measured and compared in each group.

RESULTS: Analysis showed a low validity of CRP as screening test in neonatal sepsis (Sensitivity=35.525%, specificity=58.0%, PPV=85% and NPV=11.83%). Initial screening test validity of CRP was low in EONS (sensitivity=17.16%, specificity=58.33%, PPV=72.72% and NPV=9.81%) compared to LONS (sensitivity=77.45%, specificity=57.14%, PPV=92.94% and NPV=25.80)

CONCLUSION: CRP as a screening test has low screening validity in early onset neonatal sepsis compared to late onset sepsis.

Key Words: Neonatal sepsis, Early onset neonatal sepsis, Late onset neonatal sepsis, C-Reactive protein, Blood culture.

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Current study was conducted to measure screening validity of CRP as an initial tool for screening NS. In current research, NS was investigated in 385 neonates. Three hundred and thirty-five neonates (87.0%) had culture proven NS, while 50 neonates (13.0%) had only clinical sepsis. This study concluded a higher percentage of NS compared to other studies concluded by Karamat et al.,11 Goheer et al.,4 Mane et al.,9 and Ansari et al.12 This higher rate was reported due to selection of cases having clinical features of NS. Similar prevalence was also reported by Butt et al.13 Current research showed EONS in 269 neonates (69.9%) and LONS in 116 neonates (30.1%). Similar results were reported by others.4,9,12 A higher rate of EONS compared to LONS was reported due to poor antenatal coverage of high risk deliveries and delayed maternal sepsis screen.14

CRP was positive in 140 (36.4%) cases. In EONS group, 55 (20.4%) neonates had positive CRP; whereas in LONS it remained positive in 85 (73.3%) neonates. Validity of CRP (sensitivity, specificity, positive predictive value, and negative predictive value) in NS (EONS & LONS) remained 35.52%, 58.0%, 85.0%, and 11.83%, respectively. In early onset, NS validity of CRP (sensitivity, specificity, positive predictive value, and negative predictive value) as initial screening test remained 17.16%, 58.33%, 72.72%, and 9.8%, respectively; while in late onset, sepsis validity (sensitivity, specificity, positive predictive value, and negative predictive value) of CRP was 77.45%, 57.14%, 92.94%, and 25.80%, respectively. This difference in study results were reported by Anwer et al.,5 Butt et al. 13, Shirazi et al.,6 Vergnano et al.,10 Naher et al.,5 Cetin et al.,16 Lee et al.,17 Kordek et al.,18 and Hisamuddin et al.19

Study results indicate that in comparison to late onset NS, CRP has a low validity as screening biomarker in early onset NS.

The study has certain limitations. Results might be more indicative, if other screening tests like total leukocytes/Absolute neutrophil count (ANC) also considered as one of the screening biomarkers for NS and results compared accordingly with blood culture. Study would have been improved, if determinants of NS included with comparison drawn between early and late onset sepsis.

CONCLUSION

Study concluded a low screening validity of CRP as initial septic marker in NS. Moreover, CRP is non-reliable
test to screen NS before 72 hours of birth; however, it has better screening accuracy in late onset sepsis. In early onset NS CRP should not be used as initial screening test instead of other tests should be relied upon until confirmation of blood culture.

ETHICAL APPROVAL:
Ethical Approval was taken from Ethical Review Commette of Khyber Medical University before beginning of research work.

PATIENTS’ CONSENT:
Informed consents were taken from the parents (mother or father) of newborn willing to contribute in the study.

CONFLICT OF INTEREST:
Authors declared no conflict of interest.

AUTHOR’S CONTRIBUTION:
FK: Abstract, introduction, methodology, results, discussion, analysis and conclusion were written and done.

REFERENCES