Pediatric Alert Score (EPA) performance in sepsis screening

Desempenho do Escore Pediátrico de Alerta (EPA) no rastreio da sepse

Desempeño del Puntaje Pediátrico de Alerta (EPA) para el rastreo de la sepsis

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Abstract

Objective: To assess Pediatric Alert Score (EPA) performance in screening cases of sepsis in a hospital context.

Methods: This is a diagnostic test study guided by the Standards for the Reporting of Diagnostic Accuracy Studies (STARD) recommendations. The sample consisted of 190 children and adolescents admitted to a hospital in the countryside of Bahia, Brazil. Data collection was carried out in the database of an umbrella project in medical records and the hospital's records system. Processing and analysis were performed in SPSS® version 25.0 for Windows and MedCalc® version 20.00. EPA performance in sepsis screening when compared to the reference standard criteria was measured through sensitivity, specificity, predictive values and ROC curve.

Results: Among the participants, 53.2% were male, with a mean age of 4.39 years (SD: 4.28) and a median of 3 years (IQR: 1 – 8). The prevalence of sepsis identified by the reference standard was 10% and by EPA (23.1%). The sensitivity, specificity and positive and negative predictive values of EPA in sepsis screening were 73.7%, 82.5%, 31.8% and 96.6%, respectively. The area under the ROC curve was 0.794.

Conclusion: The study presents evidence on EPA performance in sepsis screening, demonstrating good accuracy in discriminating pediatric patients with and without sepsis in the studied sample.

Resumo

Objetivo: Avaliar o desempenho do Escore Pediátrico de Alerta (EPA) no rastreio de casos de sepse em um contexto hospitalar.

Métodos: Estudo de teste diagnóstico guiado pelas recomendações do *Standards for the Reporting of Diagnostic Accuracy Studies* (STARD). A amostra foi de 190 crianças e adolescentes internados em um hospital do interior da Bahia, Brasil. A coleta foi realizada em banco de dados de um projeto guarda-chuva, em prontuários e sistema de registros do hospital. O processamento e análise foram realizados no *SPSS® version* 25.0 *for Windows* e *MedCalc®* version 20.00. O desempenho do EPA no rastreio da sepse quando comparado aos critérios do padrão de referência foi mensurado através da Sensibilidade, Especificidade, Valores Preditivos e curva ROC.

Resultados: Dentre os participantes, 53,2% eram do sexo masculino, com média da idade de 4,39 anos (DP: 4,28) e mediana 3 anos (IIQ: 1 – 8). A prevalência da sepse identificada pelo padrão de referência foi de 10% e pelo EPA 23.1%. A sensibilidade, especificidade e valores preditivos positivo e negativo do EPA no rastreio de sepse foram de 73,7%, 82,5%, 31,8% e 96,6%, respectivamente. A área sob a curva ROC foi de 0,794.

Conclusão: O estudo apresenta evidências sobre o desempenho do EPA no rastreio da sepse, demonstrando boa acurácia na discriminação de pacientes pediátricos com e sem sepse na amostra estudada.

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Conflicts of interest: nothing to declare.

Resumen

Objetivo: Evaluar el desempeño del Puntaje Pediátrico de Alerta (EPA, por sus siglas en portugués) para el rastreo de casos de sepsis en un contexto hospitalario.

Métodos: Estudio de prueba diagnóstica guiado por las recomendaciones del *Standards for the Reporting of Diagnostic Accuracy Studies* (STARD). La muestra estuvo compuesta por 190 infantes y adolescentes internados en un hospital del interior del estado de Bahia, Brasil. La recopilación se realizó en un banco de datos de un proyecto paraguas, en historias clínicas y en el sistema de registros del hospital. El procesamiento y el análisis se realizaron en el *SPSS® version* 25.0 *for Windows* y *MedCalc®* version 20.00. El desempeño del EPA para el rastreo de la sepsis, cuando se lo compara con los criterios del modelo de referencia, se midió a través de la sensibilidad, especificidad, valores predictivos y curva ROC.

Resultados: Entre los participantes, el 53,2 % era de sexo masculino, con edad promedio de 4,39 años (DP: 4,28) y mediana de 3 años (IIQ: 1 – 8). La prevalencia de la sepsis identificada por el modelo de referencia fue del 10 % y por el EPA del 23,1 %. La sensibilidad, la especificidad y los valores predictivos positivo y negativo del EPA para el rastreo de la sepsis fue del 73,7 %, 82,5 %, 31,8 % y 96,6 %, respectivamente. El área bajo la curva ROC fue de 0,794.

Conclusión: El estudio presenta evidencias sobre el desempeño del EPA para el rastreo de la sepsis y demuestra una buena precisión en la discriminación de pacientes pediátricos con y sin sepsis en la muestra estudiada.

Introduction

In the pediatric age group, sepsis has a high incidence, being responsible for high rates of morbidity and mortality, which represents a major challenge for healthcare services and professionals.[1,2] Mortality is generally associated with the presence of organic dysfunction resulting from tissue hypoperfusion, conditions that develop in the first 48 to 72 hours of treatment.[3]

A study on the prevalence and outcomes of sepsis in children admitted to public and private hospitals in Latin America showed that the cumulative prevalence of sepsis, severe sepsis and septic shock in public versus private hospitals was 43.8% versus 38.3%, 26.8% versus 22.6% and 21.5% versus 14.1%, respectively. In public hospitals, mortality was associated with higher levels of severity at the time of admission to the Intensive Care Unit (ICU).[4]

The high prevalence, high morbidity and mortality rates and high costs for institutions related to sepsis/septic shock make its screening a concern.[5] Authors highlight the need to improve early recognition and prompt treatment of pediatric sepsis before admission to the ICU in order to improve prognosis, as the unfavorable outcome may be associated with late recognition, delay in diagnosis and treatment.[2,4]

The greatest challenge of sepsis is centered on early and accurate diagnosis, which must be based on use of clinical data and screening instruments applicable in any scenario, whether with available or limited resources.[1]

From the perspective of early sepsis diagnosis and septic shock in pediatrics, there is a proposal for screening or screening tools, as the clinical picture is commonly preceded by manifestations of deterioration.[3,6-8] With regard to tools described in the literature to support the assessment of sepsis severity and diagnosis in pediatrics, the Pediatric Sequential Organ Failure Assessment (pSOFA), the age-adjusted quik Sequential Organ Failure Assessment (qSOFA) and the Pediatric Early Warning Score (PEWS).[6,7,9-13]

Thus, pSOFA is a tool that measures organ dysfunction secondary to sepsis in critically ill children, in order to assess severity and predict mortality. The age-adjusted qSOFA aims to predict mortality and disease severity in pediatric patients with suspected or confirmed infection. Both pSOFA and age-adjusted SOFA are adapted versions of SOFA and qSOFA originally developed for adults.[6,7,13,14]

PEWS are instruments initially derived from EWS for adults, originally developed to measure clinical deterioration in pediatric patients in order to trigger timely care and prevent progression to worsening. Some recent studies have raised the possibility of using PEWS to screen for signs of sepsis in pediatrics to support early diagnosis.[10-12]

In Brazil, some PEWS have already been validated, such as EPA,[9,12] developed from the Brazilian version of the Brighton Pediatric Early Warning Score (BPEWS-Br).[15] The score was considered easy to use, good structure and presentation, including indicators of clinical relevance. It consists of neurological, respiratory and cardiovascular assessment criteria, ranging between 0 and 11 points. The

authors suggested that, given the indicators of clinical worsening included in EPA, it could be tested as an alternative for sepsis screening, which raised the need to assess this possibility.[9,12]

Based on the above context and gaps in scientific production on PEWS performance in screening for sepsis in pediatrics, this study raised the following research question: How accurate is PEWS in screening for sepsis in hospitalized children and adolescents? The objective was to assess EPA performance in screening cases of sepsis in a hospital context.

Methods

This is an epidemiological, diagnostic test, retrospective study, linked to an umbrella research project developed to support the recognition of pediatric clinical deterioration in a hospital context of a municipality in the state of Bahia.

To assist in manuscript construction, the Standards for the Reporting of Diagnostic Accuracy Studies (STARD) guidelines, an instrument developed to improve the quality of reports on diagnostic test studies, were followed.[16]

The field of study was the clinical-surgical inpatient and emergency units of a large maternal and child hospital, with 260 beds, which assists patients aged 0 to 18 years, located in the municipality of Feira de Santana, the second largest city in the country state of Bahia - Brazil, with a population of approximately 615 thousand inhabitants.

The study population was made up of children and adolescents aged 0 to 15 years, treated at the hospital and registered in the umbrella project database.

The sample calculation for the umbrella project followed the recommendations for prevalence studies and was based on the following formula: N = Z2 (P (1-P)) / D2, where z-value was 1.96; p-value (expected prevalence) was 17%, based on the proportion of clinical deterioration in a previous study;[15] and d-value (CI half-amplitude) was 0.05. Therefore, the sample size calculation for this study was done as follows: N = 1.96^2 (0.17 (1 – 0.17)) / (0.052) = + 10% = 240.

The sample taken for this study was made up of 190 children and adolescents aged 0 to 15 years, from the 260 patients registered in the umbrella project database. A total of 70 patients were excluded, of which 20 participated in the pilot test and 50 had no record in their medical records of clinical criteria determined as a reference standard for confirming or not sepsis diagnosis.

Children and/or adolescents aged 0 to 15 years, hospitalized in the pediatric emergency observation and stabilization and in the clinical-surgical units of the aforementioned hospital, regardless of length of stay, were included.

Patients whose medical records did not contain data on clinical criteria determined as a reference standard for sepsis diagnosis, newborns, adolescents aged 16 years or older, patients using invasive mechanical ventilation, carriers of heart disease, suffering from oncological diseases, in isolation or with medical discharge in medical records, were excluded. The exclusion of the pediatric heart disease and oncology population was based on the exclusion criteria used to validate EPA.

In diagnostic test studies, the measurement of the tested instrument (index test) is compared with that of the adopted reference standard, in order to verify the ability of the index test to identify a certain event. In this study, the index test was EPA, assessed for performance in sepsis screening. The reference standard adopted for confirming or not confirming cases of sepsis were the criteria recommended by the International Pediatric Sepsis Consensus Conference (IPSCC).[17]

The variables that make up EPA are part of neurological assessment (alert, voice responsive, pain response and unresponsive), respiratory assessment (breathing pattern, respiratory rate and oxygen support) and cardiovascular assessment (skin color, capillary refill time, heart rate, temperature and diuresis).[9,12]

The IPSCC criteria were included as reference standard variables due to their use by the medical team in the research field and their consolidation in pediatrics, despite there being strong criticism regarding their use. However, current definitions of sepsis in pediatrics do not yet have the necessary precision to be used at the bedside.[1]

The IPSCC defines sepsis in pediatrics as a suspected or proven infection caused by a pathogen or clinical syndrome with a high possibility of infection accompanied by at least two of these clinical manifestations, such as change in temperature, tachycardia or bradycardia, tachypnea, change in leukocytes, with the presence of abnormalities in temperature or white blood cell count.[17]

The reference values adopted for respiratory and heart rate according to age group were the same as those used in the EPA validity study to recognize clinical deterioration, which was based on the values recommended by the American Heart Association, Brazilian Guidelines on Acquired Pneumonia in the Community in Pediatrics and World Health Organization.[9,12]

Secondary data was collected from June to October 2021 in two stages. In the first stage, data relating to the sociodemographic, clinical variables and EPA application of children and adolescents included in the study were collected from the umbrella project database. In the second stage, information for the reference standard was collected from data from the institution's records system and medical records, recorded within 24 hours after application of EPA.

EPA application in the umbrella project was carried out by a nurse trained for this purpose. Training was carried out based on the EPA application manual, which includes guidelines on the assessment of each clinical criterion that makes up the score. The data collected in the second stage corresponded to clinical criteria for sepsis diagnosis adopted in the study reference standard.

For the purposes of processing and statistical analysis of collected data, the Statistical Package for the Social Sciences (SPSS®) version 25.0 for Windows and MedCalc® Statistical version 20.007 were used.

For descriptive analysis of nominal qualitative variables, absolute and relative frequencies were calculated. For quantitative variables, measures of central tendency (means and medians) and measures of dispersion (standard deviation and interquartile range) were calculated. To analyze EPA accuracy in sepsis screening, the following were calculated: sensitivity, specificity, receiver operator characteristic curve - ROC Curve, positive and negative predictive values, with their respective 95% Confidence Intervals.

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Results

Flow of study participants

The flow of study participants is shown in Figure 1, considering the cut-off point ≥ 3 points on EPA.

Sociodemographic and clinical characterization of children and adolescents participating in the sample

Table 1 describes the participating child and adolescent sociodemographic and clinical characterization. The prevalence was of children under 5 years old, with the mean age being 4.39 years old (SD: 4.28) and the median being 3 years old (IQR: 1 – 8). Regarding skin color, origin and income, the majority declared themselves black/brown, residents of other municipalities, with a family income of up to one minimum wage. Regarding clinical characteristics, a considerable percentage had some comorbidity and 40% were hospitalized due to suspected infection. The mean length of stay was 12 days (SD: 20.98), and the median was 4 days (IQR: 2 – 13). According to EPA classification, the majority showed mild to moderate signs of clinical deterioration.

Receiver Operator Characteristic Curve – ROC curve

Figure 2 represents the ROC curve corresponding to the application of EPA in screening sepsis cases. A score ≥ 3 would be the best cut-off point, as it

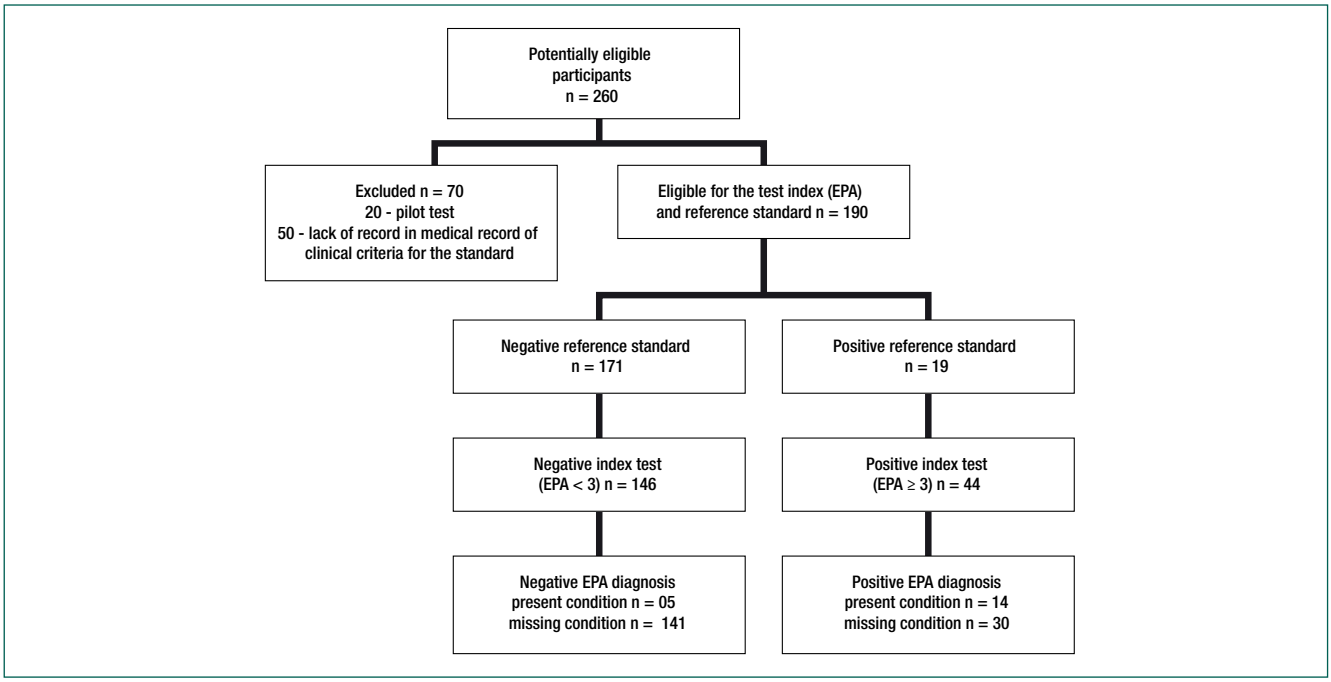

Figure 1. Flow of study participants

Table 1. Distribution of sociodemographic and clinical characteristics of children and adolescents

Sociodemographic and clinical characteristics	Frequency n(%)
Sex	
Male	101(53.2)
Female	89(46.8)
Age range (years)	
0 – 5	122(64.2)
6 – 10	47(24.7)
11 – 15	21(11.1)
Skin color (self-declared)	
Black/brown	134(70.5)
Not black/brown	56(29.5)
Origin	
Other municipalities	111(58.4)
Feira de Santana	79(41.6)
Family income	
Up to one minimum wage	139(73.2)
Above one minimum wage	51(26.8)
Comorbidity	
Yes	58(30.5)
No	132(69.5)
Pediatric Alert Score Classification	
No signs of deterioration	76(40.0)
Mild signs of deterioration	70(36.8)
Moderate signs of deterioration	30(15.8)
Severe signs of deterioration	14(7.4)

maximizes and balances the best sensitivity (73.7%) and specificity (82.5%) values. The area under the ROC curve, which demonstrates the instrument's performance in discriminating the presence and absence of sepsis, was 0.794 (95% CI: 0.730 - 0.849), that is, the probability of the EPA correctly classifying patients with and without sepsis was 79.4% in the studied sample.

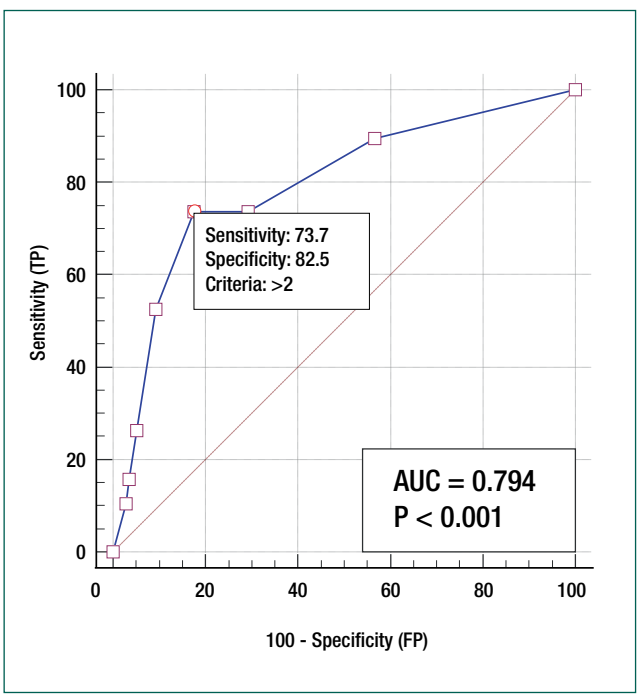

Figure 2. ROC curve for EPA application in sepsis screening

Table 2. Distribution of accuracy indicators of the Pediatric Alert Score in screening cases of sepsis in hospitalized children and adolescents according to cut-off points

EPA	S	95% CI	Sp	95% CI	PPV	95% CI	NPV	95% CI
≥ 0	100.0	82.4 – 100	-	-	10.0	10.0 – 10.0	-	-
≥ 1	89.5	66.9 – 98.7	43.3	35.7 – 51.1	14.9	12.5 – 17.7	97.4	90.8 – 99.3
≥ 2	73.7	48.8 – 90.9	70.8	63.3 – 77.5	21.9	16.4 – 28.6	96.0	91.9 – 98.1
≥ 3	73.7	48.8 – 90.9	82.5	75.9 – 87.8	31.8	23.4 – 41.6	96.6	93.0 – 98.4
≥ 4	52.6	28.9 – 75.6	90.6	85.3 – 94.6	38.5	24.9 – 54.0	94.5	91.4 – 96.5
≥ 5	26.3	9.1 – 51.2	94.7	90.2 – 97.6	35.7	17.2 – 59.8	92.0	89.8 – 93.8
≥ 6	15.8	3.4 – 33.1	97.1	92.5 – 98.7	33.3	12.0 – 64.8	91.2	89.4 – 92.6
≥ 7	10.5	1.3 – 33.1	100.0	93.3 – 99.0	28.6	7.7 – 65.8	90.7	89.3 – 91.9

S - Sensitivity; CI - Confidence Interval; Sp - Specificity; PPV - Positive Predictive Value; NPV - Negative Predictive Value.

Prevalence of sepsis and EPA accuracy indicators in sepsis screening

The prevalence of sepsis in the sample, according to the reference standard, was 10% (19 cases), considered low. The prevalence by the index test was 23.1% (44 cases), which showed an increase in sepsis cases identified by the EPA. Table 2 presents EPA accuracy indicators in sepsis screening for each cut-off point found in the sample. Regarding the EPA's ability to identify or rule out suspected cases of sepsis, the cut-off point ≥ 3 presented the best sensitivity and specificity values (73.7% and 82.5%), as also demonstrated in the ROC curve (Figure 2). Regarding predictability, the PPV (31.8%) was low and the NPV was high (96.6%).

Discussion

The use of instruments to support sepsis screening in pediatrics is considered a challenge. The Surviving Sepsis Campaign 2020 guidelines for sepsis and septic shock treatment in pediatrics state that, in relation to protocols for clinical and laboratory recognition, there is not enough data to suggest any specific screening instrument. However, since early recognition and treatment improve prognosis, it is recommended that hospitals have a performance improvement program for sepsis, implementing protocols for recognition, resuscitation, stabilization and performance measurement.[3,18]

From this perspective, PEWS, developed to assist in early recognition of clinical deterioration, have been used in different settings, including to support sepsis screening.[7] These scores, through clinical information accurate and associated with a care algorithm, aim to save time in the face of potential severe risk and can improve team confidence.[12,19]

Research to test PEWS validity in sepsis screening and early detection is necessary due to scarcity of validated instruments for this purpose, especially in environments with limited resources, which do not have electronic alert systems. Furthermore, strengthening PEWS application in nurses' practice can broaden their clinical perspective and promote empowerment in patient assessment as well as improve communication with the medical team.[19]

In this study, EPA was compared with IPSCC criteria for diagnosing sepsis in pediatric patients, as some of these criteria are similar to the EPA assessment indicators, such as changes in temperature, heart rate and respiratory rate. Hence, the score could track clinical signs of sepsis and even more advanced conditions, such as septic shock, in which patients may present perfusion changes such as increased capillary refill time and reduced diuresis, variables also present in EPA.[12,17]

Concerning the prevalence of sepsis determined by the reference standard and EPA in this study, there was a considerable difference, in which the index test showed a prevalence higher than the standard by 13%. However, when it comes to sepsis, suspecting diagnosis and ruling it out would be safer than not screening suspected cases. No data were found on the prevalence of pediatric sepsis in Brazilian emergencies, but a multicenter study on sepsis epidemiology in ICUs in Brazil found, in a sample of 280 patients who met the criteria for severe sepsis or septic shock, a prevalence of 25% (95% CI 21.6–28.8).[20]

As for EPA performance in screening cases of sepsis in children and adolescents in the studied sample, the results were promising. A score ≥ 3 was the best cut-off point for detecting cases of sepsis. Furthermore, the ability of the score to discriminate the presence and absence of sepsis, when compared to the reference standard, presented a value classified as having good accuracy.[21] PPV was considered low, probably due to the low prevalence of sepsis in the studied sample, but NPV was high, which may indicate that, given an EPA < 3, the probability of a patient having sepsis would be reduced, which can reassure healthcare professionals health in screening.

Regarding the instruments developed and validated specifically to assess sepsis in pediatrics, studies highlight the qSOFA and pSOFA.[6,10,13,14] PEWS, originally validated to detect clinical deterioration, have recently been identified as a possibility for screening clinical signs of sepsis, however few studies have investigated this hypothesis.[7,12]

A review study with meta-analysis that assessed the age-adjusted diagnostic accuracy of qSOFA to predict mortality and severity in pediatric patients with suspected or confirmed infection, analyzed eleven studies, totaling 172,569 patients. The sensitivity and specificity of qSOFA for predicting mortality were 0.73 (95% CI 0.66 - 0.79) and 0.63 (95% CI 0.21 - 0.92), and for predicting severity, were 0.73 (95% CI 0.21- 0.97) and 0.72 (95% CI 0.11- 0.98), respectively. The area under the ROC curve was 0.733. According to the authors, evidence suggests that qSOFA has moderate predictive value for mortality and severity in pediatric patients with suspected or confirmed infection, highlighting that qSOFA is a simple and viable method for use in resource-limited environments. However, there is still a need for a screening tool with greater sensitivity in pediatrics.[6]

A cross-sectional study with 60 patients treated at a pediatric hospital in Venezuela with suspected infection sought to determine the usefulness of qSOFA in diagnosing sepsis. Of the patients with sepsis, 37.7% recorded a score ≥ 2. The qSOFA sensitivity was 73.9%, and specificity, 24.3%. The conclusion was that qSOFA is a simple scale that can be applied at any level of care, which facilitates the identification and stratification of risk in pediatric patients with sepsis. The qSOFA was validated as a predictor of mortality, but not as a diagnostic criterion for sepsis; however, it can support the diagnosis of a possible previously unidentified infection, in addition to dispensing with laboratory tests for rapid detection.[22]

In 2017, there was an adaptation and validation of a pediatric version of pSOFA for critically ill children, showing excellent discrimination for in-hospital mortality, with an area under the curve of 0.94 (95% CI, 0.92-0.95).[13] A retrospective cohort study in 9 US pediatric hospitals, with patients between January 2012 and January 2020, to predict in-hospital mortality among all patients and in patients with suspected infection treated in the emergency department concluded that pSOFA had low sensitivity as a screening tool. Pediatric patients with increasing pSOFA scores were at increased risk of death. Moreover, pSOFA ≥ 2 had a sensitivity of 0.65 and specificity of 0.97 for mortality.[15]

In relation to EWS application in sepsis assessment, research with adults MEWS and the National Early Warning Score (NEWS) for the rapid assessment of organ failure related to sepsis/SIRS in patients outside the ICU. The conclusion was that these tools were more accurate in predicting death and transfer to the ICU when compared to qSOFA.[23]

In the field of pediatrics, a retrospective cohort verified the performance of seven different PEWS to predict admission to intensive care of febrile children who presented to the emergency room. A total of 11,449 eligible febrile emergency room visits identified from the electronic medical record over two years were included. The primary outcome was admission to the ICU within 48 hours. The secondary outcomes were length of hospital stay > 48 hours and sepsis-related mortality. All PEWS demonstrated excellent discrimination for ICU admission (area under the ROC curve ranged from 0.91 - 0.95) and sepsis-related mortality (area under the ROC curve ranged from 0.95 - 0.99). The conclusion was that the results support using a national PEWS in the pediatric emergency to recognize suspected sepsis

to improve outcomes, but suggest additional validation in other settings.[7]

A cohort study that validated a new adapted qSOFA score (Liverpool Quick Sequential Organ Failure Assessment (LqSOFA)) for use in febrile children in the emergency department compared its performance with age-adjusted qSOFA, with a PEWS and with the high-risk criteria of the National Institute for Health and Care Excellence (NICE) in predicting admission to the ICU within 48 hours. The results found showed the area under the ROC curve in predicting ICU admission by LqSOFA of 0.81 (95% CI: 0.76 - 0.86) versus qSOFA 0.66 (95% CI: 0.60 - 0.71), PEWS 0.93 (95% CI: 0.90 - 0.95) and NICE high-risk criteria of 0.81 (95% CI: 0.78 - 0.85). The authors concluded that LqSOFA performed better than qSOFA, suggesting additional validation.[10] It is noteworthy here that PEWS had excellent performance in relation to the other scores.

In Brazil, to date, some studies on PEWS validation and application in the early recognition of clinical deterioration have already been published. However, no national studies have been identified that verified PEWS accuracy in detecting and/or screening sepsis in pediatric hospital settings, what makes this research unique. [12,15,24]

In addition to the instruments already mentioned, some studies have attempted to validate automated predictive models of critical decompensation to screen for sepsis, using clinical variables and patients' health history from electronic medical records.[25] However, in contexts with limited resources, these warning systems may be unfeasible. Therefore, in scenarios with limited resources, good practices, such as early recognition and appropriate timely treatment, are pillars of sepsis management by healthcare professionals.[26] Therefore, simple screening technologies, such as screening tools such as PEWS, can be a good option.

The present study has the limitations of having been carried out in a hospital, retrospectively, through secondary data collection, which resulted in the failure of complete records of the criteria adopted as a reference standard to close or rule out sepsis diagnosis in part sample. Furthermore, there was a low prevalence of sepsis in the sample studied, which may have directly influenced the positive predictive value found.

The scarcity of published studies on PEWS application in sepsis screening also made it difficult to compare and discuss the results found. Therefore, other validation studies of PEWS in sepsis screening need to be carried out in order to expand their validity evidence.

Conclusion

The study presents the first evidence on PEWS performance in screening for sepsis in a Brazilian hospital context. EPA presented good sensitivity, specificity, global accuracy and negative predictive values in the sample studied, and may be capable of assisting healthcare professionals in detecting or ruling out suspected cases of sepsis in pediatrics. However, positive predictivity was low and the score increased the prevalence of cases when compared to the reference standard. Therefore, other studies to expand the evidence of its validity in sepsis screening need to be carried out. It is worth mentioning that improving care for patients in early sepsis screening goes beyond the application of an alert score. In the hospital context, it is necessary to have a system that involves not only early recognition, but also timely intervention and systematic monitoring of patients, in addition to training and constant monitoring of the care provided by the healthcare team, in order to promote patient safety.

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Collaborations

Souza MMC, Miranda JFO, Dini AP, Sobrinho CLN, Souza KAO, Morais AC, Oliveira TL and Freitas KS contributed to study design, data analysis and interpretation, article writing, critical review of relevant intellectual content and approval of the final version to be published.

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