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Combined Use of (1, 3)-B-D-glucan and Fungal Culture for Diagnosing Fungal Sepsis in Paediatric Intensive Care Unit

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Abstract

Background: Fungal pathogens are an increasingly important cause of infection in paediatric intensive care unit (PICU) patients. Rapid and accurate diagnosis of invasive fungal infection (IFI) is essential but difficult.

Aim of Study: This study aimed to evaluate the use of non-invasive serum (1,3)-β-D-glucan (BDG) test combined with fungal culture for the early diagnosis of fungal infections in the PICU.

Patients of Methods: Prospective cohort study conducted on 66 randomly selected paediatric patients between 30 days and 18 years of age with sepsis, with probable fungal infection, at the paediatric intensive care unit of children's Hospital, Ain Shams University. A complete medical history, physical examination, and laboratory investigations, including fungal culture and serum (1,3)-β-D-glucan were performed.

Results: A statistically significant increase in serum (1,3)-β-Dglucan levels was observed in patients with positive fungal cultures compared to those with negative cultures, with a *p*-value of less than 0.001 and a cutoff value of 641pg/ml.

Conclusion: Serum (1,3)-β-D-glucan is of value in early prediction of fungal infection in critically ill patients.

Key Words: *(1,3)-β-D-glucan – Fungal culture – Fungal sepsis – Invasive fungal infections.*

Introduction

THE incidence of invasive fungal infections has increased globally over the past 2 to 3 decades in healthcare facilities. Candida species are reported to be the fourth most common nosocomial pathogen in the national nosocomial infections surveillance system (NNIS) conducted by the centers for disease control (CDC) **[1].**

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Many patients with clinically suspected fungal infections are treated empirically with antifungal therapy, which may involve unnecessary use of expensive and toxic drugs **[2].**

Early detection and treatment of IFIs is essential to reduce morbidity and mortality in these populations. (1,3)-β-D-glucan is a component of the fungal cell wall that can be detected in the serum of infected individuals.

The serum (1,3)-β-D-glucan test is a way to quickly detect these infections and initiate treatment before they become life-threatening **[3].**

Rapid and accurate diagnosis of invasive fungal infections (IFI) is essential, but difficult because culture requires at least 2 to 3 days of incubation, and for some species, the incubation period is several days or more, which may further delay the initiation of antifungal treatment.

Abbreviations:

ABG : Arterial blood gases.
ALT : Alanine aminotransferase.
AST : Aspartate aminotransferase.
BDG : 1,3 B-D-glucan.
CBC : Complete blood count.
CDC : Centers for disease control.
CNS : Central nervous system.
CRP : C-reactive protein.
CVC : Central venous catheter.
CVP : Central venous pressure.
GCS : Glasco coma scale.
IA : Invasive aspergillosis.
IC : invasive candidiasis.
IFI : Invasive fungal infection.
NNIS : National nosocomial infections surveillance system.
PICU : Paediatric intensive care unit.
SOFA: Sequential organ failure score.
TPN : Total parentral nutrition.
UOP : Urine output.

Therefore, exclusive reliance on culture may lead to delayed diagnosis and thus the need for additional testing methods like (1,3)-β-D-glucan emerged **[4].**

(1,3)-β-D-glucan is a polysaccharide that forms a major and specific component of the cell walls of most fungi. (1,3)-β-D-glucan can be detected in serum during invasive fungal infections **[5].**

Aim of the work:

The aim of this study is to assess the role of combined use of serum (1,3)-β-D-glucan assay associated with fungal culture for early diagnosis of fungal infection in paediatrics intensive care unit.

Patients and Methods

Study design:

Prospective cohort study was conducted in paediatric intensive care unit, Ain Shams University Hospital over one year from July 2022 to July 2023. Sixty-six paediatric patients aged between 30 days and 18 years old who presented with sepsis with probable fungal infection to paediatric intensive care unit, were recruited randomly.

Based on the results of the fungal culture, patients were categorized into two groups: Those with positive fungal cultures and those with negative fungal cultures.

Selection criteria for cases:

The inclusion criteria consisted of patients with sepsis who exhibited life-threatening organ dysfunction resulting from a dysregulated immune response to infection **[6].**

This organ dysfunction can be assessed using paediatric Sequential Organ Failure Assessment (SOFA) score and sepsis is considered when pSOFA score more than 2 **[6].**

Leon score and Ostrosky-Zeichner score were used to assess risk factors for developping invasive fungal infection in PICU such as Surgery, total parentral nutrition (TPN), multifocal colonization, PICU stay for at least 4 days, antibiotic use, central venous catheter (CVC), hemodialysis, pancreatitis, steroids and immunosupression **[7,8].**

The exclusion criteria included patients with collagen vascular diseases, those with hemophagocytic lymphohistiocytosis and individuals with Raynaud's phenomenon.

Ethical considerations:

The study was carried out following approval from the Research Ethics Committee of the Faculty of Medicine, Ain Shams University.

Informed consent was obtained from the parents prior to enrolling patients in the study (FMASU 847/2022).

Study tools and procedures:

History taking: Personal history (age, sex, consanguinity, order of birth and address), History of present illness to determine cause of sepsis including fever, chest infection symptoms (cough, wheeze, respiratory distress), gastrointestinal infection symptoms (vomiting, diarrhea, abdominal distension), Central nervous system (CNS) infection symptoms (disturbed level of consciousness, convulsion) and past history of medical importance.

Intensive care stay time, Intensive care unit mechanical ventilator day, inotropes, lung condition (infection, chest X-ray changes, atelectasis, pleural effusion, pneumonia and any pulmonary complication), inotropes and vasodilators index and overall mortality during study time were estimated.

Thorough Clinical examination every hour: Vital data including heart rate, blood pressure, respiratory rate, temperature, Central venous pressure (CVP), urine output and Glasco coma score were assessed. A comprehensive systemic examination was performed, including assessments of the cardiac, neurological, gastrointestinal, and respiratory systems.

Laboratory investigations (initially upon suspicion of fungal sepsis): Complete blood count (CBC), blood gases (ABG), C-reactive protein (CRP), Kidney functions (urea, creatinine) and liver functions (ALT, AST, Albumin), serum electrolytes (Sodium, Potassium, Magnesium and Phosphorus), fungal culture and serum level of (1,3)-β-D-glucan (BDG) were done.

For serum (1,3)-β-D-glucan: A total of 2mL blood samples were allowed to clot for 20 minutes in sterile dry venipuncture tubes devoid of additives or gel barriers at room temperature. Subsequently, the sera were separated via centrifugation at 3000 × g for 20 minutes and stored at −80°C until analysis. The serum levels of (1,3)-β-D-glucan were quantified using a (1,3)-β-D-glucan ELISA Kit, a sandwich ELISA assay (Catalog No: E4636Hu, BT Lab - Shanghai Korain Biotech Co. Ltd., China), with a detection range of 8–2000ng/L.

Prior to use, all reagents and samples were equilibrated to room temperature. In the assay procedure, 50μL of standard was added to the standard wells, and 40μL of sample was added to the sample wells along with 10μL of anti-BDG antibody. Following this, 50μL of streptavidin-HRP was introduced. The mixture was covered and incubated for 60 minutes at 37°C, then washed five times with wash buffer. Substrate A and B were added, followed by a 10-minute incubation. A stop solution was added, and the optical density (OD) was measured using a microplate reader set to 450nm. A standard curve was constructed by plotting the average OD values against the corresponding concentrations.

For Fungal culture: Under sterile conditions, 1-5mL of blood was aseptically collected and directly inoculated into BACTECTM Myco/F Lytic Culture Vials at the bedside. The inoculated vials were promptly transported to the laboratory, where they were placed into the BACTECTMFX 40 system and monitored for 42 days for signs of microbial growth.

Positive cultures were subjected to subculturing, and the identified microorganisms were characterized using standard laboratory techniques.

Statistical analysis and statistical pacakage:

Recorded data were analyzed using the statistical package for social sciences, version 27.0 (SPSS Inc., Chicago, Illinois, USA). The quantitative data were presented as mean ± standard deviation and ranges when their distribution was parametric (normal) while non-normally distributed variables (non-parametric data) were presented as median with inter-quartile range (IQR). Also qualitative variables were presented as number and percentages. Data were explored for normality using Mann Whitney test. The Comparison between groups with qualitative data was done by using Chi-square test. Pearson's correlation coefficient (*r*) test was used to assess the degree of association between two sets of variables. *p*-value less than 0.05 will be considered statistically significant.

Results

The results from fungal blood cultures were obtained after a duration of 10 to 15 days, whereas serum levels of (1,3)-β-D-glucan were available within 2 days of sample collection.

Table (1): Demographic data and characteristics of the studied patients.

		No.=66
Age in years	Median (IQR) Range	4 (1.8-8) 0.17-15
Sex	Male Female	29 (43.9%) 37 (56.1%)
Consanguinity in degree	No consanguinity Second degree Remote consanguinity	46 (69.7%) 19 (28.8%) 1 (1.5%)
Anthropometric measures	General examination	
Weight in kgs	Median (IQR) Range	17.5 (11-24) 5-60
Weight z-score	Median (IQR) Range	-0.08 (-0.79-0.79) -3.83-1.96
Height in cm	Mean ± SD Range	99.11±28.95 58-162
BMI	Mean ± SD Range	17.8±7.4 (11.9-22.9)
BMI z-score	Median (IQR) Range	-0.25 (-0.43 – -0.04) -0.76 - 0.87

Table (2): Serum (1,3)-β-D-glucan levels and fungal culture results of the studied patients.

		No.=66
Serum (1,3)-β-D-glucan	Median (IQR) Range	603.6 (324.3-932.4) 57.1-1860
Fungal culture	Negative Positive	51 (77.3%) 15 (22.7%)
	Negative Candida tropicalis Candida parapsilosis Candida albicans Candida non-albicans	51 (77.3%) 1 (1.5%) 1 (1.5%) 9 (13.6%) 4 (6.1%)

Out of the 66 patients studied, 51 (77.3%) had positive fungal cultures, while 15 patients (22.7%) had negative results. Among the patients with positive fungal cultures, Candida tropicalis was identified in one patient, Candida parapsilosis was in one patient, Candida albicans was in nine patients, and other non-albicans Candida species were found in four patients.

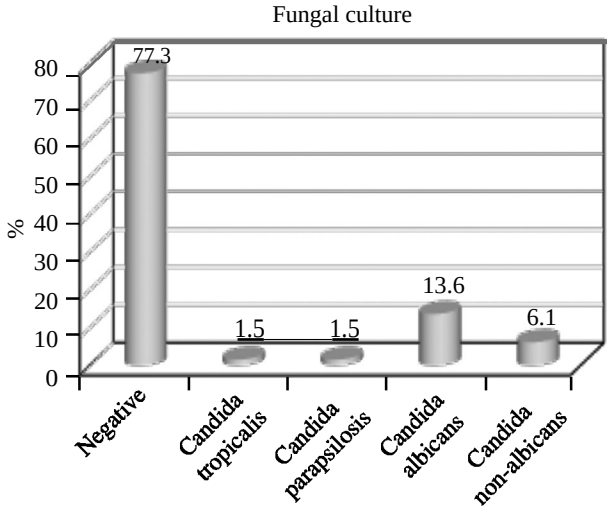

Fig. (1): Percentage of fungal culture results of the studied patients.

Table (3): Comparative analysis of serum (1,3)-β-D-glucan levels between the fungal culture-positive and fungal culture-negative groups.

Serum (1,3)-β-D-glucan	Fungal culture		Test value ‡	*p*-value	Sig.
	Negative No.=51	Positive No.=15			
Median (IQR)	499.7 (273.9-793.1)	1049 (829.7-1215)	-4.904	0.000	HS
Range	57.1-1036	702.8-1860			

p-value >0.05: Non significant (NS).
p-value <0.05: Significant (S).
p-value <0.01: highly significant (HS).
‡: Mann Whitney test

The relationship between fungal culture results and serum (1,3)-β-Dglucan levels showed a statistically significant difference, with higher serum (1,3)-β-D-glucan levels observed in positive fungal culture cases compared to negative ones, yielding a *p*-value of less than 0.001.

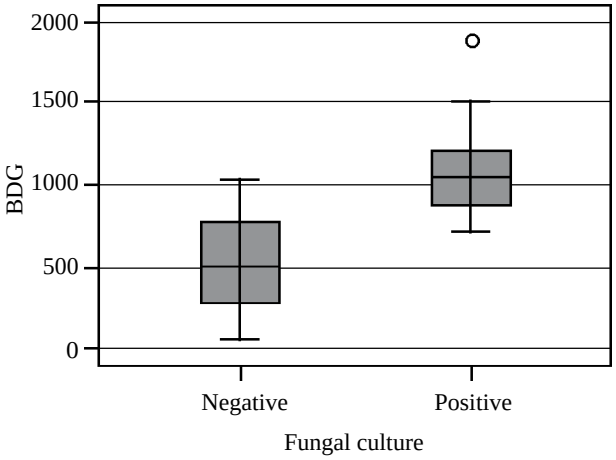

Fig. (2): Relation of fungal culture with (1,3)-β-D-glucan.

Table (4): Relation of fungal culture with SOFA score, Leon score and Ostrosky zeichner score.

	Fungal culture		Test value	*p*-value	Sig.
	Negative No.=51	Positive No.=15			
SOFA score:					
Median (IQR)	5 (4-6)	6 (4-6)	-1.122	0.262	NS
Range	3-8	3-9			
Leon score:					
Median (IQR)	3 (3-4)	3 (3-4)	-1.293	0.196	NS
Range	2-4	3-4)			
Ostrosky zeichner score:					
Positive	51 (100.0%)	15 (100.0%)	NA	NA	NA

p-value >0.05: Non significant (NS).
p-value <0.05: Significant (S).
p-value <0.01: Highly significant (HS).
‡: Mann Whitney test

The relationship between fungal culture results and the SOFA score, León score, and Ostrosky-Zechner score [which represent risk factors for fungal infections such as Surgery, total parentral nutrition (TPN), multifocal colonization, PICU stay for at least 4 days, antibiotic use, central venous catheter (CVC)] was assessed. The analysis revealed no significant association between these risk factors and the development of fungal infections, as evidenced by positive fungal cultures.

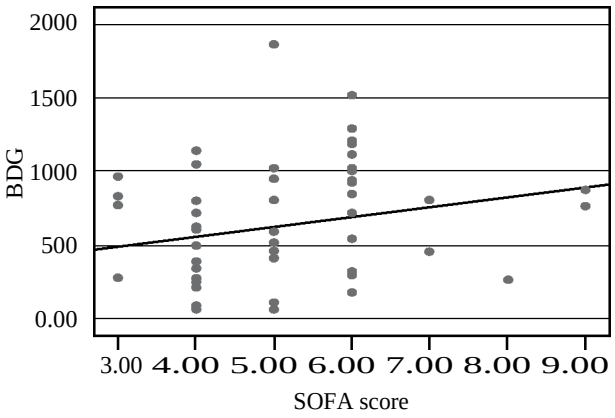

Fig. (3): Correlation of serum (1,3)-β-D-glucan with Sofa score.

The correlation between serum (1,3)-β-D-glucan levels and SOFA score was demonstrated in the figure, showing a positive correlation between serum (1,3)-β-D-glucan and SOFA score, with a *p*-value of 0.027.

Table (5): Correlation between fungal culture and other lab parameters.

	Fungal culture		Test value	*p*-value	Sig.
	Negative No.=51	Positive No.=15			
TLC:					
Median (IQR)	7.3 (2.7-14.6)	13.9 (5.4-18.5)	-1.691 ‡	0.091	NS
Range	0-61.4	0.5-38.8			
Hb:					
Mean ± SD	9.37±1.57	9.57±2.35	-0.383•	0.703	NS
Range	6.2-13.9	4.5-15.3			
PLT:					
Median (IQR)	89 (62-217)	102 (57-136)	-0.222 ‡	0.824	NS
Range	12-638	14-527			
CRP:					
Median (IQR)	62 (23.2-124.8)	75.5 (32-123)	-0.237 ‡	0.813	NS
Range	0.3-387.8	1.7-160			
Urea:					
Median (IQR)	30 (20-50)	36 (16-50)	-0.375 ‡	0.708	NS
Range	4-266	2-66			
Creatinine:					
Median (IQR)	0.3 (0.2-0.7)	0.3 (0.3-0.4)	-0.016 ‡	0.988	NS
Range	0.1-4.7	0.1-1			
ALT:					
Median (IQR)	23 (15-40)	27 (19-57)	-1.026 ‡	0.305	NS
Range	2-1050	10-106			
AST:					
Median (IQR)	31 (19-59)	46 (27-105)	-1.110 ‡	0.267	NS
Range	45-844	12-216			

Table (5): Count.

	Fungal culture		Test value	p-value	Sig.
	Negative No.=51	Positive No.=15			
Albumin:					
Mean ± SD	3.26±0.70	3.31±0.63	-0.209•	0.835	NS
Range	2.1-4.7	2-4.7			
Na:					
Mean ± SD	137.98±5.83	142.20±9.14	-2.145•	0.036	NS
Range	127-158	130-167			
K:					
Mean ± SD	4.29±0.90	4.19±1.00	0.344•	0.732	NS
Range	2.1-5.9	2.2-6.3			
Mg:					
Mean ± SD	1.96±0.47	1.97±0.45	-0.105•	0.917	NS
Range	1.1-4	1.3-3			
Po4:					
Mean ± SD	4.05±1.74	3.23±0.93	1.743•	0.086	NS
Range	1.5-10.1	1.2-4.5			

p-value >0.05: Non significant (NS).
p-value <0.05: Significant (S).
p-value <0.01: Highly significant (HS).
‡: Mann Whitney test

The correlation between fungal culture result and the studied parameters is detailed in the preceding table showed a non significant relationship between fungal infection and different laboratory parameters.

Table (6): Sensitivity and specifity of serum (1,3)-β-D-glucan test.

Parameter	AUC	Cut of point	Sensitivity	Specificity	PPV	NPV
Serum (1,3)-β-D-glucan	0.919	≥641	100.0	70.59	50.0	100.0

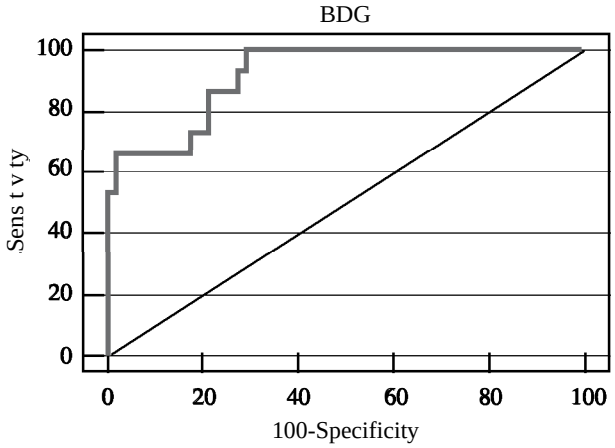

Fig. (4): ROC curve of serum (1,3)-β-D-glucan as a predictor of positive fungal culture as a predictor of positive fungal culture.

The figure and table above indicated that serum (1,3)-β-D-glucan has a positive predictive value for the presence of positive blood cultures at a cutoff value of 641. The sensitivity and specificity at this cutoff were 100% and 70.59%, respectively.

Serum (1,3)-β-D-glucan levels of ≥ 641 and a SOFA score of ≥ 2 were important thresholds for predicting fungal infections. Specifically, a high SOFA score and elevated serum (1,3)-β-D-glucan levels were strong indicators of fungal infections. In contrast, factors such as total parenteral nutrition (TPN), central venous catheter (CVC) insertion, fungal colonization, and the use of broad-spectrum antibiotics were statistically non-significant but still contribute to the risk.

Discussion

Invasive fungal infections (IFI) are increasingly common in critically ill patients, with Candida albicans responsible for 13% of ICU infections. IFI is associated with a high mortality rate, with deaths attributable to these infections reaching up to 49% **[9].**

Our study included 66 patients aged between 30 days and 18 years, all with sepsis and suspected fungal infections, recruited from the Pediatric Intensive Care Unit (PICU) at Ain Shams University Hospital.

According to the fungal culture results, the enrolled patients were divided into two categories: The fungal culture-positive group, consisting of 15 patients (22.7% of the participants) and the fungal culture-negative group which consisted of 51 patients (77.3% of the participants).

In the current study, patients with confirmed fungal infections (positive fungal culture group) had a mean age of 3 years, with a range from 0.33 to 7 years. In comparison, patients with negative fungal cultures had a mean age of 4 years, ranging from 1.8 to 8 years. The p-value of 0.22 indicates that there is no significant relationship between age and the fungal culture results.

The occurrence of PICU-acquired fungal infections in this age group could be attributed to their heightened susceptibility to severe illness, which required the use of more invasive devices and aggressive antibiotic treatments in the ICU. This increased exposure may had predisposed them to fungal infections.

In the study by Elgendy FM **[10]**, 166 patients (60%) under the age of 1 year were found to have fungal infections in the PICU, which indicated a higher susceptibility to infection compared to older age groups, with a statistically significant difference.

Regarding gender distribution, there was a predominance of females among patients with fungal

infections, with females accounting for 66.7% of the culture-positive cases, compared to 33.3% for males. In contrast, the culture-negative group comprised 52.9% females and 47.1% males. The difference in fungal infection rates between genders was relatively small and not statistically significant.

In the study done by Egger M *[11]*, Females represented 51.2% of invasive candidiasis cases, mostly matching the proportions of females among the general population in the United States and Europe (>51%). In contrast, other IFIs were overrepresented in males, including invasive aspergillosis (51% males), mucormycosis (60%), cryptococcosis (74%), coccidioidomycosis (70%), histoplasmosis (61%) and blastomycosis (66%).

In the context of risk factors for invasive fungal infections, including SOFA score greater than 2, central venous catheter (CVC) insertion, prolonged hospital stay, use of intravenous antibiotics, and previous surgery (as represented by Leon score and Ostrosky-Zeichner score), did not show a significant association with the results of fungal cultures.

According to Li W *[12]*, Sepsis, total parenteral nutrition, 1,3-β-D-glucanhigh level, and sequential organ failure assessment (SOFA) score were identified as independent risk factors for invasive fungal infection by multivariate logistic regression analysis.

In the current study, patients with positive fungal cultures had a median ICU stay of 20 days, while those with negative cultures had a median stay of 21 days. This suggested no significant relationship between ICU stay duration and fungal culture results, which came in contrast with findings from other studies. This discrepancy could be attributed to the higher incidence of secondary infections in our PICU, where patients developed various infections with different organisms during their ICU stay.

In the study by Giacobbe DR *[13]*, patients with candidemia were more frequently associated with the presence of a central venous catheter (CVC) (82% compared to 65% for those with bacteremia), more likely to have received antibiotic treatment (88% versus 49%), and had a longer hospital stay before developing the fungal infection (median of 21 days versus 14 days).

In the study of Sandhar TK *[14]*, the most common risk factor (54.8%) was prolonged intensive care unit stay while in our study the median of PICU stay in negative group was 21 days similar to positive group 20 days showing non significant relation.

Concerning laboratory abnormalities in the enrolled patients, no statistically significant differences were observed between the fungal infection-positive and negative groups concerning hemoglobin levels, platelet counts, or other inflammatory markers titers. However, both groups exhibited lower hemoglobin levels, elevated CRP, and higher titers of other inflammatory markers, consistent with sepsis syndrome.

This was consistent with the findings of Elgendy FM *[10]*, where fungal infections were associated with elevated CRP titers, anemia, thrombocytopenia, and leukocytosis. These abnormal infection markers were indicative of sepsis syndrome, regardless of whether the infections were isolated or associated with other factors, which put the patient at higher morbidity and mortality and made him more immunocompromised, increasing the chance for opportunistic organisms.

Regarding fungal blood cultures results in our study, Candida albicans was identified in 13.6% of all cultures and accounted for approximately 59% of positive fungal cultures. Non-albicans species were found in 9.1% of cultures and represented about 41% of positive fungal cultures.

According to Al-Dorzi HM *[15]*, Candida is one of the 10 leading causes of blood stream infections in developed countries. An estimated 33–55% of all episodes of candidemia occurs in ICUs and is associated with mortality rates ranging from 5 to 71%.

In the study by Elgendy FM *[10]*, Candida albicans was identified as the most common colonizing organism, affecting approximately 156 patients (31.7%). Candida glabrata was isolated from 53 patients (10.8%), Aspergillus flavus from 36 patients (7.3%), and other fungi included Candida krusei, Candida parapsilosis, and Candida tropicalis.

Concerning mortality, positive fungal culture group had higher risk of mortality (46%), compared to negative fungal culture group (29%).

In the study of Hlophe ST *[16]*, The in-hospital mortality for invasive fungal infection was 36% compared with 16% for all admissions.

Regarding the relation between serum (1,3)-B- D-glucan level and SOFA score, the critically ill patients with high SOFA score greater then 2, had higher serum serum (1,3)-B-D-glucan level results with p-value of 0.02 demonstrating a significant rise in SOFA score with high serum levels of (1,3)-B-D-glucan.

White Pl *[17]*, showed similar results as the median SOFA score increased with (1,3)-B-D-glucan concentration In a patient with a (1,3)-BD-glucan concentration consistently ≤100 pg/mL, the median SOFA score was 2, increasing to 5 for (1,3)-B-D-glucan concentrations between 100 and 299pg/mL, and 7 when the (1,3)-B-D-glucan concentration was >300pg/mL.

Additionally, Azoulay *[18]*, identified that factors independently associated with elevated

(1,3)-β-D-glucan levels (more than 80pg/mL) included the presence of invasive fungal infections (IFI) and a high admission SOFA score.

In the current study, serum (1,3)-β-D-glucan levels in positive fungal culture group ranged from 829.7 to 1215pg/mL, with a median concentration of 889pg/mL. In contrast, serum (1,3)-β-D-glucan levels in negative culture group ranged between 273.9 and 793.1pg/mL, with a median of 499.7pg/mL. The observed *p*-value (<0.001) indicates a highly significant association between (1,3)-β-D-glucan levels and the presence of fungal infection.

Also in Sandhar TK *[14]*, Out of the total samples, 455 (52.8%) samples were found positive for (1,3)-B-D-glucan. fungal elements were seen in 48 (10.5%) KOH smears and fungal growth was obtained in 81 (17.8%) cultures. Optimum serum (1,3)-B-D-glucan sensitivity and specificity of 79.2% and 70.3%, respectively were observed at a cutoff of 142.4pg/mL.

Christner M *[19]* also reported that patients with invasive candidiasis showed higher levels of serum (1,3)-B-D-glucan and higher test positivity rates than patients without invasive candidiasis.

Our study affirmed that seum (1,3)-β-D-glucan is a highly effective biomarker for the early detection of fungal infection, with an optimal cutoff value of 641pg/mL. This marker demonstrated a perfect sensitivity of 100% and a specificity of 70.59%.

In the study of He S *[20]* , it was found that Serum BDG detection is highly accurate for diagnosing IFIs. As such, 60pg/mL of (1,3)-B-D-glucan level can be used as the best cutoff value to distinguish patients with IFIs from patients without IFI (mainly due to Candida and Aspergillus).

In the study of Hsu AJ *[21]*, The performance of the serum (1,3)-B-Dglucan assay varies for specific IFDs. The sensitivity and specificity for diagnosing invasive aspergillosis (IA) or invasive candidiasis (IC) is 77% sensitivity and 83% specificity for IA versus 81% sensitivity and 81% specificity for IC).

Conclusion:

Serum (1,3)-B-D-glucan (BDG) determination plays an important role in the diagnosis of invasive fungal infection among critically ill patients admitted to paediatric intensive care unit (PICU). (1,3)-B-D-glucan is of value in early prediction of fungal infection with a cutoff point of 641pg/ml.

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Funding:

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Ethical considerations: Prior to conducting the study, the ethical approval of Research ethical committee, Faculty of Medicine, Ain Shams University was obtained (FMASU 847 / 2022). A written informed consent was taken from the legal guardians of the children. All patients' data were kept confidential and parents/legal guardians had the right to keep them. All patients' parents had the right to withdraw from the study at any time without affecting their course of treatment.

Consent for publication: Written informed consent was obtained from all legal guardians of the children involved in the study.

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بيتا – دى جلوكان وفحص المزرعة ١،٣ الجمع بين استخدام فحص الفطرية لتشخيص الإنتان الفطرى فى وحدة العناية المركزة للأطفال

تعد مسببات الأمراض الفطرية سبب متزايد الأهمية للعدوى لدى مرضى وحدة العناية المركزة للأطفال كما يعد التشخيص السريع والدقيق للعدوى الفطرية الاجتياحية أمرًا ضروريًا ولكنه صعب.

أجريت دراسة جماعية مستقبلية على ستة وستين مريضًا من الأطفال تم اختيارهم عشوائيًا وتتراوح أعمارهم بين ثلاثين يومًا وثمانية عشر عامًا مصابين بالإنتان، مع عدوى فطرية محتملة، في وحدة العناية المركزة للأطفال بمستشفى جامعة عين شمس. تم اخذ التاريخ الطبى الكامل وإجراء الفحص البدنى والفحوصات المخبرية، بما فى ذلك المزرعة الفطرية و فحص (١،٣) بيتا – دى جلوكان.

تهدف هذه الدراسة إلى تقييم استخدام اختبار فحص (١،٣) بيتا – دى جلوكان مع المزرعة الفطرية للتشخيص المبكر للعدوى الفطرية فى وحدة العناية المركزة للأطفال.

كان هناك فروق ذات دلالة إحصائية بين المجموعة ذات المزرعة الفطرية السلبية والإيجابية فيما يتعلق ب (١،٣) بيتا – دى جلوكان والتى وجدت أعلى فى الحالات. اقل من ٠,٠٠١ p–value الإيجابية مقارنة بالحالات السلبية بقيمة يعتبر فحص (١،٣) بيتا – دى جلوكان ذا قيمة فى التنبؤ المبكر بالعدوى الفطرية بنقطة قطع تبلغ ٦٤١ بيكوغرام/مل.