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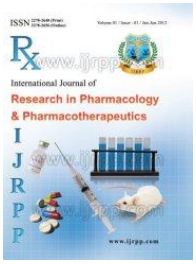

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A study on prevalence and evaluation of management of sepsis on pediatric in a tertiary care hospital

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ABSTRACT

Sepsis is the programmed consequences of an infection in the body . It can occur when the body is invaded by pathogens which can spread throughout the body and become potentially fatal . The prospective observational study was conducted to evaluate the prevalence , management of sepsis in the department of pediatrics in a hospital for a period of three months . All around 150 cases were examined thoroughly, frequently males are more affected than females within the age of 1-12 years.

Objective

The aim of our study is to evaluate the prevalence , management and co – morbidities of sepsis in pediatrics.

Methods

In our study, for the period of three months we recorded patients demographics, other laboratory data like WBC, Platelet count, Hemoglobin, CRP, CRFT, and the co-morbidities. This parameters were used to evaluate the patients with progression of sepsis like severe sepsis, refractory sepsis, shock, multi organ dysfunction and death.

Results

According to our study the prevalence of sepsis was observed in males (56%) and in females (44%). Higher percentage of our study population belonged to the age group of 1-3 years(57%) .In the sample size of 150 patients, we observed 58 cases (38%) with sepsis, 92 cases (61.3%) with co-morbidities. We perceived (recognized) that the majority of the subjects were managed with antibiotics and antipyretics. Most of the subjects were managed with IV fluids and some of them are managed with antibacterial depending on the lab investigations.

Conclusion

To inhibit the progression of sepsis, early recognition, monitoring and proper care is required for better improvement.

Keywords: LRTI, sepsis, SIRS, comorbidities.

INTRODUCTION

Sepsis is hazardous condition that is characterized by low blood pressure despite adequate fluid replacement and organ dysfunction (or) failure. The invasion of body by infectious micro-organisms can lead to poisoning of the blood (septicemia) severe sepsis, septic shock, organ failure and death in a progression manner. Pathogens like virus bacteria and fungi in the blood and tissue can lead to inflammatory responses which can cause multiple organ damage. Sepsis is mostly caused by bacterial infections such as gram-ve bacilli (E-coli, Enterococcus species) and gram+ve bacilli (staphylococcus, streptococcus) consequently fungal infections (candida species) also account for the cause of sepsis. Sepsis is characterized by fever and increased heart rate in the first stage, increased severity with dyspnea and organ failure in the second stage and decreased blood pressure (hypotension) in the third and final stage.

EPIDEMIOLOGY

5.3 million People die from sepsis annually and the incidence of sepsis that accounts for the majority cases in India (57.65%) as found to occur in children aged 0-3months. Global data on pediatric sepsis is incomprehensive but it is the observed that the majority of death\morbidity rates in children aged under 5years is caused by complications related to sepsis (infections), with other related major causes of death being congenital abnormalities, intrapartum, complications and preterm birth comphrentions . 20% of patients with sepsis and about 80% of patients with septic shock. Ultimately hyper fatal compressions as seen in cases involving post-neonatal children. Due to the mortality rate, rush diagnosis and treatment is advised as it helps to reduce the occurrence of the multiple comphretions such as shock, multi-organ dysfunction and fatal consequences.

MANAGEMENT

Management of sepsis includes initial resuscitation, antibiotic therapy, fluid therapy, inotropic therapy etc. Based on the severity and progression of the condition, initial resuscitation is based on the process implemented to adhere normal perfusion, which is based on maintaining oxygenation and proper ventilation. Then fluid resuscitation is performed to assess and manage circulation and balanced fluids were associated with improved survival in the 1-4 years and followed by antibiotic therapy\antimicrobial therapy which is classified into empiric therapy (initial therapy), targeted definitive therapy (targeted to specific pathogen), broad spectrum therapy (which broadens the range of potential pathogen covered), multi-drug therapy use of multiple anti-microbial to deliver broad spectrum therapy, and combination therapy (the use of multiple antibodies of different mechanistic classes). Inotropic\vasoactive amines are also used to manage sepsis such as dopamine, epinephrine, vasopressin, and steroids are also used for respiratory dysfunction. Initiation of a lung protective ventilation strategy using \lung volumes and additional high frequency oscillatory ventilation are introduced for endocrine dysfunction, which is also used to manage glucose metabolism and hydrocortisone with fluticortisone is used to manage adrenal insufficiency for renal dysfunction, continuous renal replacement therapy is employed as well as adjuvant extracorncal therapies like endotoxin removed or pharmaphasis for CNS\PNS dysfunction, Isotonic fluids are used as maintain fluids and the use of corticosteroids, aminoglycosides and furosemide is monoxidized as they may affect the neuromuscular axes for haemotogical dysfunction recombinant form of activated protein c (APC) is used as it decrease the mortality rate. Sepsis can also be managed by prophylactic procedures such a vaccination, sterile hygienic procedures quarantine and individualization of infection early treatment with antibiotics helps to reduce the mortality rate. Patients centered outcome research and other related strategies also help to reduce the long term morbidity of sepsis [1-5].

MATERIALS AND METHODS

The prospective observational study is to analysis the prevalence rate as well as evaluation of management of sepsis in pediatric subjects. This study being focused on an age of 1-15 years of patients in a tertiary care hospital. We recorded patients demographics ,(Age, gender , present history of illness, past medication history) diagnosis of disease based on the lab investigations like WBC, platelet count, hemoglobin, CRP, regarding the

collected information complications and co-morbidities can be evaluated.

RESULTS AND DISCUSSION

Our main goal is to reduce the risk of complications and co – morbidities by early recognition therapy as soon as possible and intensive care must be taken for better improvement. This survey was conducted to recognize the prevalence rate of sepsis and treatment evaluation. In overall 150 inpatient cases based on gender the prevalence rate of sepsis is predominantly higher in males 84(56%) than in females 66 (44%).

Table 1: Distribution based on gender (n=150)

Gender	No. of cases	Percentage%
Male	84	56%
Female	66	44%

In overall 150 inpatient cases based on gender the prevalence rate of sepsis is predominantly higher in males 84(56%) than in females 66 (44%).

Table 2: Demographic profile of study population (n=150)

Age	Males	Females	No. of cases	Percentage%
1 – 3	47	39	86	57%
4 – 6	24	16	40	26%
7 – 9	3	5	8	5.3%
10 - 12	7	4	11	7.3%

Higher percentage of our study population belonged to the age group 1-3 years (57%) were more affected due to weak immunity and the age between 13-15 years (3.3%) were less affected.

Table 3: Lab Investigations

Parameters	**Normal**	**High**	**Low**
WBC	55 (36.6%)	92 (61.4%)	3(2%)
Platelet count	96 (64%)	13 (8.6%)	41 (27.4%)
CRP	43 (28.6%)	107 (71.4%)	0 (0%)
HB	27 (18%)	6 (4%)	117 (78%)

In our study population (n=150) out of these lab parameters were observed to be 92(61.4%) cases were found to be leukocytosis and 3(2%)were observed to be leukocytopenia , 13(8.6%) were observed to be thrombocytosis and 41(27.4%) were observed to be thrombocytopenia. Other lab parameters like hemoglobin was seen in 6 (4%) with high and 117(78%) as observed to be in lower rates, 132(88%) were examined with rapid respiratory rates due to infection [6-10].

Table 4: Distribution based on Co – morbidities (n=150)

Co – morbidities	**No. of cases**	**Percentage (%)**
Sepsis	58	38.66%
Sepsis + LRTI	31	20.66%
Sepsis + Dengue fever	5	3.33%
Sepsis + Acute GI	18	12%

Sepsis + Meningitis	7	4.66%
Sepsis + Hepatitis	2	1.33%
Sepsis + Viral pyrexia	12	8%
Sepsis + Anemia	3	2%
Sepsis + UTI	4	2.66%
Sepsis + Seizure	10	6.6%

Higher rates of co – morbid conditions were found to be sepsis with LRTI 31 (20.66%) and lower rates were found with the combination of sepsis with hepatitis 2(1.33%).

Table 5: Evaluation of management

Category of drugs	No. of cases	Percentage
Antibiotics	150	100
Anti-histamines	24	16
Antacids	145	96.6
NSAIDS	7	4.6
Corticosteroids	12	8
IV fluids	118	78.6
Diuretics	9	6
Anti - convulsants	9	6
Anti - malarials	9	6
Anti - emetics	137	91.3
Analgesics	19	12.66
Anti - tussives	41	27.3
Anti pyretics	134	89.33
Anti - spasmatics	6	4

Mostly used antibiotics were ceftriaxone, amoxicillin, vancomycin, doxycycline, meropenam. Antibiotics are used in the combination such as ceftriaxone+ amoxicillin+ clavulanate 33(22%). Antibiotic therapies inhibit bacterial, fungal, viral infections such as lower respiratory tract infection, urinary tract infection, acute gastroenteritis, sepsis and also treat co-morbid conditions. 24 cases were managed with anti-histamines such as Chloramphenіramine + phenylephrine 17 (70.6%) and rarely hydroxyzine, fexofenadine and cetirizine, these are used to relief symptoms like cold, cough allergies, flu, runny nose, breathing illness. 145 cases were treated with Antacids such as ranitidine (92.4%) and pantoprazole (7.60%),these are used to treat GI problems. Non-steroidal anti-inflammatory drugs as prescribed for 7 cases, camylofin dihydrochloride (4) cases and Acetaminophen (3) cases. Their pharmacological action is to reduce pain, decrease fever, prevent blood clots and decreases inflammation like SIRS (systemic inflammatory response syndrome).

Corticosteroids were given to 12 cases, drugs such dexamethasone and hydrocortisone these provide relief body inflammation, swelling, redness, itching and allergic conditions. Out of 150 cases, 118 cases were treated with IV fluids such as dextrose normal saline and ringer lactose used for fluid volume replacement to correct electrolyte imbalance. In most cases Anti pyretics such as Paracetamol were given in fever conditions.

Some of the patients were managed with Diuretics such as Mannitol, furosemide to increase the amount of water and salt expelled from the body as urine. Rare cases were treated with Anti – Consultants such as fosphenytoin sodium and midazolam given in epilepsy and meningitis.

Least cases Anti – malarial such as combiether forte and articulate treat high grade fever. Anti – emetics (ondansetron) to treat vomiting and nausea. Analgesics (tramadol – relieve severe pain and inflammation). Anti – spasmodic (hyoscine butyl bromide) used for smooth muscle relaxation and to prevent spasms of stomach intestine and urine bladder.

CONCLUSION

Our study was to know the prevalence and evaluation of management of sepsis in a tertiary care hospital. Among the study population n=150 we found males 56% are more prone to sepsis and higher percentage of population belong to the age group 1- 3 years.

As per the prevalence study we observed that

1. More number of cases of sepsis in the study population seen was males (56%).
2. According to age1-3 years are affected more because at this age group children are with weak immune system.
3. In our study we found (61.4%) increased in WBC count and 71.4% increase in CRP due to increase in infection in sepsis patients.
4. From our study we found 20.6% are co-morbidities with LRTI and 12% acute gastroenteritis is due to infection (environment).
5. In our study cases, sepsis subjects were treated with Antibiotics for infection. Commonly used drugs are Ceftriaxone, Amoxicillin, and Clavulanate. In co-morbid conditions Antibiotics, Anti –bacterial , Antihistamines, Antacids, Antipyretics, Corticosteroids , Diuretics, Anti-convulsants, Antimalarial, Anti-tussive, Anti-spasmodic were used.
6. In our study we found the most of the comorbid conditions are due to environmental factors. To prevent this early recognition, monitoring and proper care is required for better improvement.

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Conflicts of interests

The author(s) declare(s) that they have no conflicts of interests to disclose.

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