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Study of Children Presenting with Acute Life Threatening Emergencies to the Emergency Sevice Room

KEYWORDS: emergencies,children,etiology

Dr. SIVUNI SRILATHA
Assistant Professor of Pediatrics,Government General Hospital,Kurnool Medical College Kurnool.

Dr. PUTTA RAJASEKHAR
Professor of Medicine,Government General Hospital,Kurnool Medical College Kurnool.

ABSTRACT *Varied etiological causes in the pediatric age group can present with acute life threatening emergencies. Although over years general trends of pediatric morbidity (1) have been reported, not much published information is available about the pattern of emergencies.Most of the published information is from developed countries (2).India now entered a stage where health care administrator and policy maker should give sufficient importance to the resources of existing tertiary care hospital apart from provision of basic health care to larger population.This prospective study highlights, the spectrum of cases presenting with acute life threatening emergencies and the outcome in relation to the nature of the presentation.*

AIMS AND OBJECTIVES

- To know the incidence of children presenting with acute life threatening emergencies to the pediatric emergency service room.
- To study the nature of problem presenting with acute life threatening emergency.

DEFINITION

According to American Academy of pediatrics and American Heart association, any child who is presenting with near total or total airway obstruction, respiratory failure, hypotensive shock, abnormalities of sensorium are defined as having acute life threatening emergencies.

MATERIALS AND METHODS

All the cases of children presenting with life threatening emergencies satisfying "pediatric advanced life support" guidelines for life threatening condition admitted to the Department of Pediatrics Govt.General Hospital,Kurnool Medical College,Kurnool for a period of 6 months from 1st December 2011 to 31st May 2012 were included in the study.

INCLUSION CRITERIA

Age:2 months to 18 years

Children presenting with life threatening emeregency to the emergency service room as per the pediatric advanced life support guidelines.

EXCLUSION CRITERIA

- Age less than 1 month and more than 18 years
- In patient children developing acute life threatening emergencies.

METHODS

An observational prospective study of in patients admitted in Department of Pediatrics Govt.General Hospital,Kurnool.

DATA COLLECTION

Children admitted in Department of Pediatrics,Govt.General Hospital,Kurnool from December 2011 to May 2012 were included in the study.

According to PALS life threatening problem is identified by

Airway	Complete or severe airway obstruction
Breathing	Apnea,Significant increased work of breathing,bradypnea
Circulation	Absence of palpable pules, poor hypotension, bradycardia
Disability	Unresponsiveness, decreased level of consciousness
Exposure	Significant hypothermia, significant bleeding, petechiae, or purpura consistent with septic shock

GENERAL ASSESSMENT

INITIAL IMPRESSION

Consciousness : Level of consciousness

Breathing : Increased work of breathing, absent or decreased respiratory effort, or abnormal sounds heard without auscultation.

Colour : Abnormal skin, colour,such as cyanosis, pallor, or mottling.

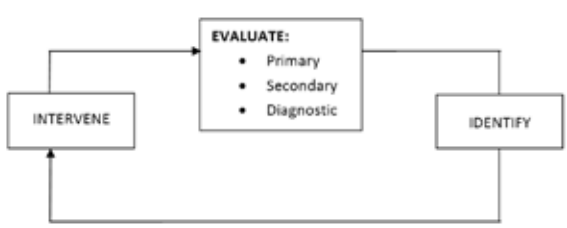

Fig 1: Initial impression

With the information gathered during evaluation child's problems identified by type and severity and intervened with appropriate actions Further evaluation done:After treating the life threatening problem If no life threatening problem is present

PRIMARY ASSESSMENT

Using ABCDE approach

Airway : Clear/Maintanable/Not maintainable

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Breathing : Respiratory rate,respiratory effort,Chest expansion Airway and lung sounds,pulse oxymetry

Circulation : Heart rate and rhythm,pulses (Peipheral and central), capillary refill time,skin colour and temperature-Blood pressure

Disability : AVPU(Alert,response to voice,response to pain,unresponsive) Scale,pupilary response to light

Exposure : Significant hypothermiaSignificant bleeding, Petechiae/Purpura,Burns,Unusual markings(non-accidental trauma)rash

SECONDARY ASSESSMENT
Focused history&examination
Using SAMPLE mnemonic
Allergies,Medications
Past medical history
Last meal,Events
General physical examination
Detailed examination of the system involved

DIAGNOSTIC TESTS:
Routine&specific diagnostic tests
CVS:Chest X-ray,ECG,ECHO,ABG Analysis
RS:Chest –ray,PFT
CNS:LP,CT brain,MRI brain
GIT: Ultrasound abdomen,LFT
Renal:RFT,Urine analysis

MANAGEMENT:
All children were managed according to PALS guidelines, during the assessment if any life threatening abnormally is present,it has to be corrected before going to next step in the assessment.After stabilizing the child supportive therapy and specific therapy initiated according to the etiological diagnostics.

Statistical Analysis:
Analysis was carried out at the end of study period with the use of smith's statistical package.

OBSERVATIONS AND RESULTS
Out of 2746 children admitted in Department of Pediatrics in the study period of December2011 to May2012,501 children had acute the threatening emergencies and constituted18.24% .

1. AGE DISTRIBUTION
Out of 501 cases were noted in the age group of less than 1 year(38.32%) followed by 1-3 years(18.9%), 6-12 years(14.37%).

2.SEX DISTRIBUTION
Number of male children were 257(57.28%) and number of female children were 214(42.72%) which slight male preponderance.

AGE AND SEX DISTRIBUTION
In all age groups male preponderance was present.

3.SEVERITY OF ACUTE LIFE THREATENING EMERGENCIES AT PRIMARY ASSESSMENT
Majority of cases presented with respiratory distress followed by altered sensorium and hypotensive shock.

Severity of Life threatening emergency	No of cases	Percentage %
Respiratory Distress	230	45.90
Respiratory Failure	9	1.79
Compensatory Shock	23	4.59
Hypotensive Shock	43	8.58
Cardio Pulmonary Failure	34	6.78
Cardio Pulmonary Arrest	4	0.79
Altered Sensorium	158	31.53
Total	501	100

Table 1: Table showing acute life threatening emergencies at primary assesment

Out of 501 cases 239(47%) cases had respiratory problem, 66(13%) cases presented with shock, 34(6.78%) cases presented with cardiopulmonary failure, 4(0.79%) presented with cardiac arrest, 158(31.5%) presented with altered sensorium.

Cardiorespiratory problems and problems of sensorium were the major presenting causes of acute life threatening emergencies. Out of 239 cases presenting with respiratory emergencies 230 were with respiratory distress, 9 with respiratory failure. Out of 66 cases presenting with shock 23 were with compensatory shock, 43 with hypotensive shock.

4.AGE WISE DISTRIBUTION OF SEVERITY OF ACUTE LIFE THREATENING EMERGENCIES AT PRIMARY ASSESSMENT Out of 192 infants presenting with acute life threatening emergencies 108 (56%) had respiratory distress, followed by 59 (30%) with altered sensorium, and cardiopulmonary failure in 14 (7%), cardiac arrest in 2 (1%). Similar were found in other age groups.

5.COMPARISON OF SEVERITY OF ACUTE LIFE THREATENING EMERGENCIES AT PRIMARY ASSESSMENT IN LESS THAN 1 YEAR AND GREATER THAN 1 YEAR
Compensatory shock and hypotensive shock as acute life threatening emergencies had statistically significant incidence in children more than 1 year age group with P values 0.046 and 0.0001 respectively.

SEVERITY OF ACUTE LIFE THREATENING EMERGENCIES	AGE				Total	P- Value
	<1 Year n=192		<1 Year n=309			
	N	%	N	%		
Respiratory Distress	106	55.20%	124	40.12%	230	0.0009
Respiratory Failure	6	3.125%	3	0.97%	9	0.0775
Compensatory Shock	0	0%	23	7.44%	23	0.046
Hypotensive Shock	3	1.56%	40	12.94%	43	0.0001
Cardio Pulmonary Failure	14	7.29%	21	6.79%	35	0.834
Cardio Pulmonary Arrest	3	1.56%	1	0.32%	4	0.16
Altered Sensorium	60	31.25%	97	31.39%	157	0.9735
TOTAL	192	100%	309	100%	501	

Table2:Comparision of severity of acute life threatening emergencies at primary assesment in<1year and >1yr age

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6.Sex distribution of acute life threatening emergencies at primary assessment

Severity of occurrence of acute life threatening emergencies at primary assessment has no significant relation with the type of gender.

SECONDARY ASSESMENT

1.Distribution of type and severity of acute life threatening emergencies at secondary assessment.

Majority of cases were lung parenchymal disease followed by seizures and acute encephalopathy syndrome.

Out of 226 children presenting with respiratory life threatening emergency 186(37.12%) had lung parenchymal diseases. 21(4.19%) had lower airway obstruction. 12(2.39%) had disordered control of breathing and 7(1.39%) were with lower airway obstruction.

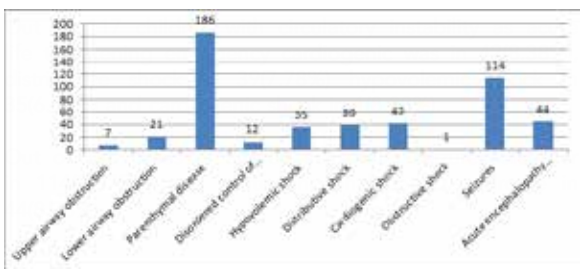

Fig2 Distribution of type and severity of acute life threatening emergencies at secondary assessment

2.Age in relation to type and severity of acute life threatening emergencies at secondary assessment

In all age groups majority of causes of acute life threatening emergencies were parenchymal lung diseases followed by seizures.

3.COMPARISON OF TYPE AND SEVERITY OF ACUTE LIFE THREATENING EMERGENCIES AT SECONDARY ASSESSMENT IN LESS THAN 1 YEAR AND GREATER THAN 1 YEAR

Table3 shows parenchymal lung diseases as a cause of respiratory distress was statistically highly significant.(P value 0.0001) in infants compared to children more than 1 year.

Cardiogenic shock and hypovolemic shock as a cause of circulatory instability presenting as acute life threatening emergency were more common in children more than 1 year compared to infants with P value 0.0001 and0.0431 respectively.

TYPE AND SEVERITY	AGE				Total	P Value
	< 1 Year	%	>1 Year	%		
Upper airway obstruction	3	1.56%	4	1.29%	7	0.8037
Lower airway obstruction	4	2.08%	17	5.50%	21	0.0633
Parenchymal disease	96	50%	90	29.12%	186	0.0001HS
Disordered control of breathing	3	1.56%	9	2.91%	12	0.3365
Hypovolemic shock	2	1.041%	33	10.67%	35	0.001
Distributive shock	10	5.20%	29	9.38%	39	0.0897
Cardiogenic shock	10	5.20%	29	9.38%	42	0.0431S
Obstructive shock	0	0	1	0.32%	1	0.4301
Seizures	49	25.52%	65	21.03%	114	0.02443
Acute encephalopathy syndromes	15	7.81%	29	9.38%	44	0.5454
Total	192	123	309	100	501	

Table3: Comparision of severity of acute life threatening emergencies at secondary assesment in<1year and >1yr age

4.DISTRIBUTION OF INFECTIOUS AND NON INFECTIOUS CAUSES OF ACUTE LIFE THREATENING EMERGENCIES

Infectious causes contributed76.1% of the total acute life threatening emergencies and non infectious causes contributed23.9%

5.DISTRIBUTION OF INFECTIOUS CAUSES OF ACUTE LIFE THREATENING EMERGENCIES

Majority of infectious causes of acute life threatening emergencies are pneumonia (47.24%), VHF and complications (16.79%), meningo encephalitis (13.1%) in that order.

6.DISTRIBUTION OF NON INFECTIOUS CAUSES OF ACUTE LIFE THREATENING EMERGENCIES

Majority of the non infectious causes of acute life threatening emergencies are congential disorders followed by asthma and envenomation (11.97%) in that order.

OUTCOME

Out of total 501 cases survival was 473(94.41%) mortality was 28(5.58%)

1.AGE AND OUTCOME

Out of total 28 deaths 14(50%) were less than 1 year age,11(39.2%) were between 1 to6 years of age and 4(14.2%) were between 6 to18 years of age.The survival and death percentages were similar.There was no variation in outcome in relation to age.

2.COMPARISON OF OUTCOME IN RELATION TO AGE

There was no significant association between age and outcome of cases , divided into less than1 year and more than1 year age groups.P value 0.1909 shows no statistical significance between the age of child and outcome.

3.COMPARISON OF SEVERITY OF ACUTE LIFE THREATENING EMERGENCY AT PRIMARY ASSESSMENT WITH OUTCOME

Table4 shows comparison of severity of acute life threatening emergency at primary assessment with outcome. Children who have presented with respiratory distress and compensatory shock had highest survival rates (statistical significant,P value0.0001,0.046 respectively)compared to other causes.

Children who have presented with cardiopulmonary failure and cardiopulmonary arrest had highest mortality rate(statistically significant P value 0.0003, 0.0001 respectively)in comparison to other causes.

Age group	Survival N=473	Death N=28	P Value
Respiratory Distress	229	1	0.0001
Respiratory Failure	8	1	0.40
Compensatory Shock	23	0	0.0465
Hypotensive Shock	41	2	0.8445

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Cardio Pulmonary Failure	27	8	0.0003HS
Cardio Pulmonary Arrest	1	3	0.0001HS
Altered sensorium	144	13	0.0528

Table4: Comparision of severity of acute life threatening emergency at primary assesment with outcome

4.OUTCOME IN RELATION TO TYPE AND SEVERITY OF ACUTE LIFE THREATENING EMERGENCIES AT SECONDARY ASSESSMENT

Type and Severity of acute life threatening emergency	Outcome	
	Survival N=473	Death N=28
Upper airway obstruction	7 (100%)	0
Lower airway obstruction	21 (100%)	0
Parenchymal disease	183 (98.3%)	3(1.6%)
Disordered control of breathing	11(91.6%)	1(8.3%)
Hypovolemic shock	34(97.1%)	1(2.8%)
Distributive shock	36(92%)	3(7.6%)
Cardiogenic shock	33(78.5%)	9(21.4%)
Obstructive shock	1(100%)	0
Seizures	109(95.6%)	5(4.3%)
Acute encephalopathy syndromes	35(86.3%)	6(13.6%)

Table5:Outcome in relation to type and severity of acute life threatening emrgencies at secondary assesment

DISCUSSION

In this study 501 cases of acute life threatening were studied.Total number of admissions during the study were 2746 and children admitted with acute life threatening emergencies were 501 constituting 18.24%.

Majority of acute life threatening emergencies were observed in children less than 1 year of age (38.32%) followed by 1 to 3 years (24.75%) and 3 to 6 years (18.9%). Observations noted in this study are comparable to the studies done by Singhi S et al [3] (< 1 year 47%) and Salaria M[4] (< 1 Year 52%).

Acute life threatening emergencies shows male preponderance with (57.28%) males and (42.72%) females.Male and female ratio is 1.3:1.Similar observations were noted by Claudet I et al (M:F 1.3:1)[5].

At primary assessment majority of acute life threatening emergencies presented with respiratory distress (45.90%) followed by altered sensorim (31.53%).Similar observations were noted in the study by Macfual R et al. [6].(Breathing difficulty 24% seizures 16%).

Severity of acute life threatening emergencies at primary assessment has no significant relation with the type of gender.(P value >0.05).

At secondary assessment majority of the acute life threatening emergencies were parenchymal lung disease(37.12%)followed by seizures (22.75%).Observations noted in the study are comparable to the study done by Salaria M et al.

Parenchymal lung disease as acute life threatening emergencies was more common in infants when compared to other age groups.Similar observations were noted by Salem M B et al[7].In their study Salem M B et al reported 74.1% cases of lower respiratory tract infection.The apparent increased of lower respiratory tract infections in the above study might be because of inclusion of only acute respiratory tract infections in their study.

In a total of 501 cases of acute life threatening emergencies, infectious etiologies were 76.1% and non infectious etiologies were 23.9% Carville KS et al [8],study showed that infection accounts for majority of pediatric mortality and morbidity in developing countries.

Among the infectious etiologies of acute life threatening emergencies pneumonias contributed 47.24%,VHF and complications 16.79% followed by meningo encephalitis 13.12%.

Among the noninfectious causes of acute life threatening emergencies congenital disorders were 3% followed by asthma 13% and envenomation and intoxication 11.9%.

In a total of 501 cases survival rate was 94.41% and mortality rate was 5.58%.Study done at Institute of child health,Chennai by Santharam I et al [9], reported a mortality rate of 12.2%.The disparity in the results may be due to inclusion of neonates in the reported study which contributed for majority of deaths (67%).Mortality rate from a western study by Karabocuoglu

M. et al.[10] was 2.9%.The disparity may be due to better referral system, health care infrastructure and emergency department services.

There was no significant association of age with the outcome.P value 0.19 in our study.

In the present study the best survival rates were noted among the children presenting with respiratory distress and compensatory shock when compared to other causes.This is in comparison with survival rates described in PALS provider manual.Highest mortality rate was seen with children presenting with cardiopulmonary arrest(75%) and cardiopulmonary failure.

Outcome of acute life threatening emergencies presenting as altered sensorium was 95.6% survival with seizures,86.36% survival with acute encephalopathy syndrome.Mortality was more with acute encephalopathy syndrome 13.63%.

23% of the patients presented with shock, highest survival rates were with hypovolemic shock.Mortality rates were high for cardiogenic shock(78.5%).

Among the children presenting with shock as acute life threatening emergency highest survival rates were seen with hypovolemic shock.Highest mortality rate was seen with cardiogenic shock.

SUMMARY

In our study most of the cases were seen in less than one year age group. Respiratory distress followed by altered sensorium were the major presenting problems.Infectious causes predominate the noninfectious causes.Pneumonias, VHF and complications.Meningo encephalitis were among the infectious causes.

Survival rate among the total was 94.4%,mortality rate was 5.58%.Mortality rate is more when compared to western studies may be because of delay in detecting the acute life threatening emergency conditions,improper referral services,deficiency of trained staff in treating the emergencies.

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REFERENCE

1. DeivanayagamN,Sivarathinam S,SankarnarayananVS.Morbidity and mortality pattern of the hospitalized children at Madras city.Indian J Pediatr 1987; 54:733-737 2. Kraus BS,HarakalT,FleischerGR.The spectrum and frequency of illness presenting to a pediatric emergency department.Pediatr Emerg Care 1991;7:67-71 3. SinghS,JainV,GuptaG:Pediatric emergencies ata teritiary care hospital in India.Journal of tropical pediatrics 2003;49(4):207-211 4. SalariaM,Singhi SC;Profile of patients attending pediatric emergency service at Chandigarh,Indian J Pediatr 2003;70(8):621-624 5. Claudetl etal:Epidemiology of admission in a pediatric resucitation room:Pediatr Emerg Care 2009May25(5):312-6 6. MacfaulR etal:Parenteral and Professional perception of need for emergency admission to hospital:prospective questionnarie based study:Arch dis child 1998:79:213-218 7. SalemMB:outcome for children under five years,Hospitalised with severe acute lower respiratory tract infections in YEMEN:5 year experience:J Trop Pediatr(1998)44(6):343-346 8. CarvilleKS etal:infections is the major component of disease burden in aboriginal and non aboriginal Australian children: a population based study,Pediatr Infect DisJ2007Mar;26(3):210-6 9. Santhanaml etal,mortality after admission in the pediatric emergency department a prospective study from the referral children hospital in Southern India,Pediatr crit care Med.2002Oct;394):358-63 10. KarabocuogiuM etal,Analysis of patients admitted to the emergency unit of university childrens hospital in Turkey,Tur j Pediatr 1995Jul-Sep:37(3):209-16