

**“RAPID BEDSIDE ULTRASONOGRAPHY AND ITS
CORRELATION WITH CLINICAL ASSESSMENT IN
MANAGEMENT OF DIFFERENT TYPES OF SHOCK
IN PAEDIATRIC EMERGENCY ROOM.”**

Dissertation Submitted to

**THE TAMIL NADU DR.M.G.R.MEDICAL UNIVERSITY
CHENNAI**

*In partial fulfillment of the regulations
for the award of the degree of*

M.D. BRANCH – VII (PAEDIATRICS)



**INSTITUTE OF SOCIAL PAEDIATRICS
STANLEY MEDICAL COLLEGE, CHENNAI.**

**THE TAMIL NADU DR.M.G.R.MEDICALUNIVERSITY
TAMILNADU, INDIA**

MAY 2020

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This is to certify that this dissertation entitled “**RAPID BEDSIDE ULTRASONOGRAPHY AND ITS CORRELATION WITH CLINICAL ASSESSMENT IN MANAGEMENT OF DIFFERENT TYPES OF SHOCK IN PAEDIATRIC EMERGENCY ROOM**” submitted by **Dr.MADHUMATHI.R** to the faculty of **PAEDIATRICS**, The Tamil Nadu Dr.M.G.R Medical University, Chennai, Tamilnadu, in partial fulfillment of the requirement for the award of **M.D DEGREE BRANCH-VII (PAEDIATRICS)** is a bonafide research work carried out by her under my direct supervision and guidance.

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DECLARATION

I, **DR.MADHUMATHI.R** solemnly declare that Dissertation titled **“RAPID BEDSIDE ULTRASONOGRAPHY AND ITS CORRELATION WITH CLINICAL ASSESSMENT IN MANAGEMENT OF DIFFERENT TYPES OF SHOCK IN PAEDIATRIC EMERGENCY ROOM”** is a bonafide work done by me at Government Stanley Medical College and Hospital, Chennai, during June 2018 to May 2019 under the guidance and supervision of **Prof.Dr.M.A.ARAVIND, M.D.**, Professor of Paediatrics, Government Stanley Medical College and Hospital, Chennai. I also declare that this bonafide work or a part of this work was not submitted by me or any other for award degree or diploma to any other university, board either in India or abroad.

This dissertation is submitted to the Tamilnadu DR.M.G.R Medical University, towards the partial fulfillment of requirement for the award of **M.D. Degree (Branch – VII) in PAEDIATRICS**.

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Stanley Medical College and Hospital, Chennai.

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the resources of this Institution for my study.

CERTIFICATE - II

This is to certify that this dissertation work titled “**RAPID BEDSIDE ULTRASONOGRAPHY AND ITS CORRELATION WITH CLINICAL ASSESSMENT IN MANAGEMENT OF DIFFERENT TYPES OF SHOCK IN PAEDIATRIC EMERGENCY ROOM**” of the candidate **Dr.MADHUMATHI.R** with Registration Number **201717052** for the award of **M.D., DEGREE** in the branch of **BRANCH-VII (PAEDIATRICS)**. I personally verified the urkund.com website for the purpose of Plagiarism Check. I found that the uploaded thesis file contains from introduction to conclusion pages and result shows 2 percentage of plagiarism in the dissertation.

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ABBREVIATIONS

ER	:	Emergency Room
IVC	:	Inferior Vena Cava
CI	:	Collapsibility Index
DI	:	Distensibility Index
RV	:	Right Ventricle
LV	:	Left Ventricle
RUSH	:	Rapid Ultrasound Shock Hypotension
ACES	:	Abdominal and Cardiac Evaluation by Sonogram
POCUS	:	Point Of Care Ultrasonography In Shock
PALS	:	Paediatric Advanced Life Support
MAP	:	Mean Arterial Pressure
BP	:	Blood Pressure
US	:	Ultrasonogram
CVP	:	Central Venous Pressure
PEMC	:	Paediatric Emergency Medical Course
IV	:	Intravenous
RL	:	Ringer Lactate
NS	:	Normal Saline
CCF	:	Congestive Cardiac Failure
DKA	:	Diabetic Ketoacidosis
EHPO	:	Extra Hepatic Portal Hypertension
ALOC	:	Altered Level Of Consciousness
AVPU	:	Alert Verbal Pain responsive Unresponsive

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INTRODUCTION

Paediatric shock is one of the important cause of mortality and morbidity worldwide. Shock is defined as inability of cardiovascular system to provide adequate oxygen and nutrients to meet metabolic demands of vital organ¹. Hypovolemic shock due to acute gastroenteritis is the most common type in paediatric shock followed by septic shock². Cardiogenic and obstructive shock are less common in children. Still they are important because they are very difficult to diagnose in paediatric population.

Mortality due to shock is reduced by early recognition^{3,4}. Ultrasound has a role in identification of reversible and undifferentiated shock⁵.

Introduction and usage of ultrasound in emergency room has become a trend . Many number of protocols have been developed⁶⁻²⁸.

Review article by Conlon et al²⁹ elaborates the implementation of POCUS training in paediatric intensive care training. Even medical students and paediatric emergency care fellows are increasingly exposed to POCUS, and longitudinal curriculums have demonstrated considerable success³⁰⁻³².

In our study , we use point of care ultrasound (POCUS) which is more reliable for paediatric shock. This includes sequential ultrasound examination of heart, IVC ,aorta, intraperitoneal cavity , lungs and pleura³³. This protocol is more applicable for paediatric patients in shock.

AIM AND OBJECTIVES OF THE STUDY

- ❖ To study the bedside ultrasound POCUS findings in various types of shock in paediatric emergency room .
- ❖ To compare the clinical signs with USG findings in fluid intolerant state during the shock management.

REVIEW OF LITERATURE

Ultrasound protocols which are commonly used as follows: ACES⁶, BEAT⁷, BLEEP⁸, Boyd Echo⁹, EGLS¹⁰, Elmer / Noble Protocol¹¹, FALLS¹², FAST¹³, Extended-FAST¹⁴, FATE¹⁵, FEEL-Resuscitation¹⁶, FEER¹⁷, FREE¹⁸, POCUS-Fast and Reliable¹⁹, RUSH-HIMAP²⁰, RUSH - Pump/ Tank/ Pipes^{21,22}, Trinity²³ and UHP²⁴. USG protocol used in dyspnea are the BLUE protocol²⁵ and RADIUS²⁶.

Table-1: Ultrasound Protocols in Shock Assessment

Protocol	Aces	Beat	Bleep	Boyd Echo	Egls	Noble	Falls	Fate	Feel Resus	Feer	Pocus	Rush: Himap	Rush	Trinity	Uhp	Free
Cardiac	1	1	1	1	2	1	3	1	1	1	3	1	1	1	3	1
Ivc	2	2	2	2	3	2	4				4	2	2	3	1	
Fast	4					3					1	3	3	2	2	
Aorta	3										5	4	4			
Lungs ptx						4	2	2			2	5	5			
Lungs effusion	5				1	5	1						6			
Lungs edema					4						6		7			
Dvt											7		8			
Ectopic pregnancy											8					

These protocols differ in their examination sequence. Numbers in the table indicate order of examination.

RUSH PROTOCOL

Described by Perera et al²⁵.

Step 1:

PUMP:

Ultrasound examination of heart

It looks for

- ❖ Pericardial Effusion
- ❖ Left Ventricular contractility
- ❖ RV Strain/Diastolic collapse

Step 2:

TANK:

It includes IVC, Lungs ,Intraperitoneal cavity

IVC

- ❖ IVC diameter
- ❖ IVC collapsibility

Lung

- ❖ Effusion
- ❖ Pneumothorax (absent sliding sign),
- ❖ Interstitial edema (B profile)

Peritoneal cavity- FAST (Focused Abdominal Sonogram in Trauma).

It includes

- ❖ Right Costophrenic Recess
- ❖ Subdiaphragmatic Space
- ❖ Hepatorenal Recess
- ❖ Inferior pole of kidney.

Step 3:

PIPE:

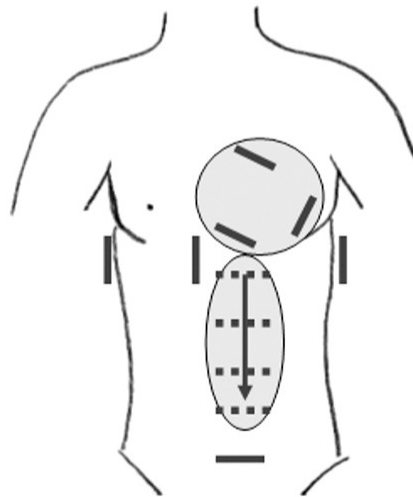
- ❖ It includes Aorta for dissection, Leg veins for DVT. By this protocol, we can assess the type of shock and manage accordingly with the findings of PUMP, TANK AND PIPE.

Table-2: Rush Protocol

RUSH exam	Hypovolemic shock	Distributive shock	Obstructive shock	Cardiogenic shock
Pump	Hyperdynamic heart	Hyperdynamic heart (early sepsis) Poor contractility (late sepsis)	Pericardial tamponade RV strain Poor contractility	Poor contractility
Tank	Small, collapsing IVC Peritoneal or pleural fluid	Normal/small IVC Pleural or peritoneal fluid	Large, non-collapsing IVC Absent lung sliding	Large, non-collapsing IVC Lung rockets Pleural effusion
Pipes	AAA or dissection	Normal	DVT	Normal

Paul Atkinson et al⁵ studied a protocol called ACE (Abdominal Cardiac Evaluation with Sonography) in undifferentiated hypotension. It includes cardiac, IVC, abdominal USG . It doesn't include lungs and deep veins of leg.

Figure-1 Aces Protocol



It consists of

- 1) Cardiac views,
- 2) Inferior vena cava view,
- 3) Abdominal aorta,
- 4) Right and
- 5) Left flank views for pleural and peritoneal fluid, and
- 6) A pelvic view for bladder size and free fluid.

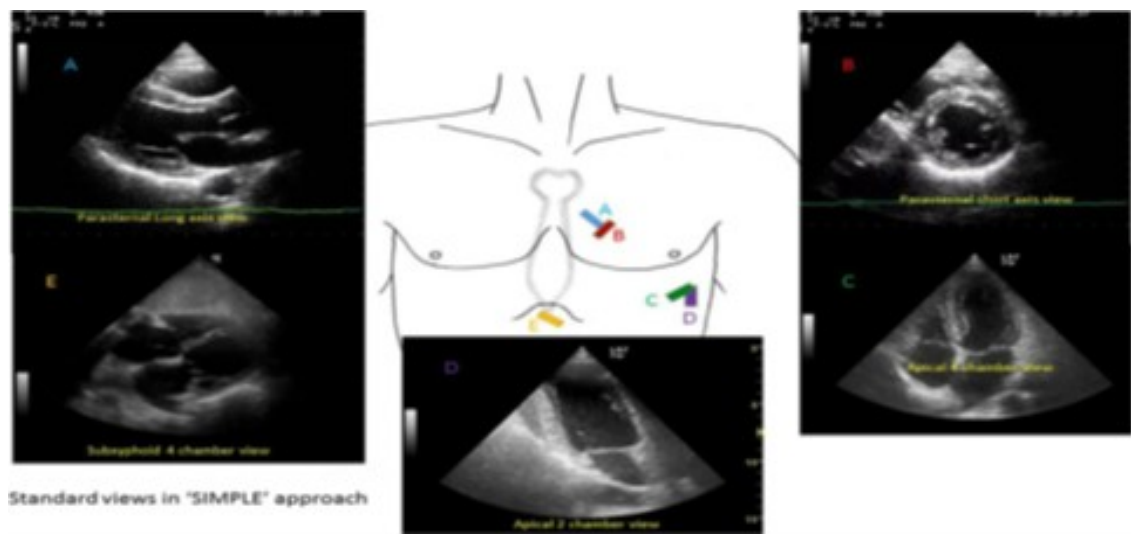
Ka Leung Mok³⁴ article of focus (focused cardiac ultrasound)

suggest SIMPLE approach for echocardiogram in shock patient.

Table-3 Simple Approach In Focused Cardiac Ultrasound In Shock Patients

S	SIMPLE approach in focused cardiac ultrasound in shock patients
I	IVC size and collapsibility IVS movement Look for aortic dissection
M	Mass in the heart chambers (commonly intramural clots and atrial myxoma) Myocardium (motion and thickness)
P	Pericardial effusion Pleural effusion
L	Left ventricular systolic function
E	Abdominal aorta in the epigastrium

Figure-2 Simple View

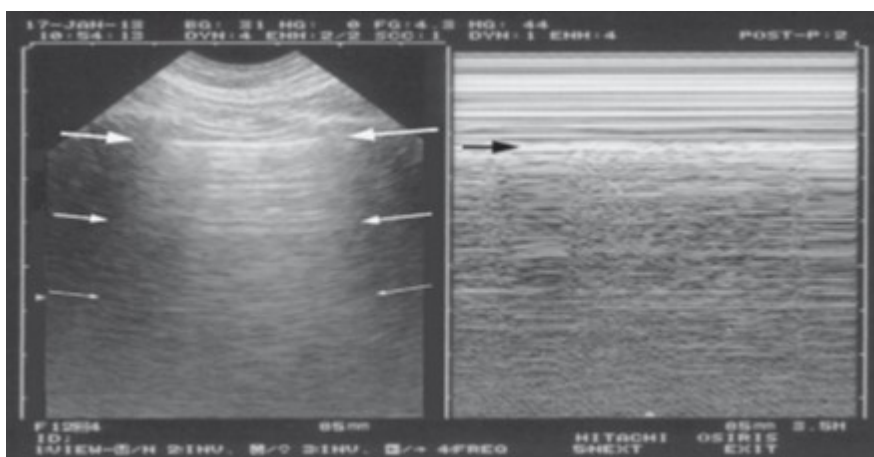


Five views include

- 1) Parasternal long axis
- 2) Parasternal short axis
- 3) Apical four-chamber
- 4) Apical two-chamber
- 5) Sub-xiphoid four-chamber views

Licheinsteins et al¹² suggested FALLS protocol (Fluid Administration Limited By Lung Ultrasonography). It is derived from BLUE Protocol (Bedside Lung Ultrasonography In Emergency). This protocol is used in critically ill patient with dyspnoea and shock.

Figure-3 A Profile



Above right picture shows the horizontal artefact of pleural line shown in arrow mark. Left side picture shows sandy homogeneous pattern called sliding lung sign. Above profile is called A Profile . It indicates normal lung.

Figure-4 B Profile



Above figure shows vertical comet tail artefact. These are called B lines. Multiple B lines indicate pulmonary interstitial oedema.

In this study, we followed a protocol POCUS²⁹ which involves USG assessment of five areas.

- 1) Heart
- 2) IVC
- 3) Aorta
- 4) Intraperitoneal cavity
- 5) Lung and pleura

HEART EXAMINATION

View: Parasternal long axis view/subxiphoid view

Location: Probe is kept just left of sternum, 3rd and 4th intercostal space

- 1) Pericardial effusion
- 2) Left ventricular contractility : Good contractility is indicated by anterior leaflet of mitral valve touching the septum. Less than 30% difference in systole and diastole indicates poor contractility(hypodynamic heart) . More than 90% difference in LV size(hyperdynamic heart) indicates increased cardiac contractility (hypovolemia/septic shock).

- 3) RV should be less than 60% size of LV. When RV size=LV size indicates RV failure due to pulmonary embolism, pneumothorax.(RV Strain)

IVC EXAMINATION:

Location: Subxiphoid, slide to patient's right

Measure IVC diameter.

Indications for IVC USG examination are

- ❖ State of volume depletion – Hypovolemia, hemorrhage
- ❖ State of volume overload – CCF
- ❖ Serial monitoring in case of bolus administration
- ❖ To assess the fluid responsiveness and intolerance.

In adults, IVC size is 1.5 to 2.5 cm in diameter. IVC less than 1.5 cm indicates hypovolemia and more 2.5 cm indicates fluid overload.

AORTA

Location: Longitudinal and transverse views of aorta at infra cardiac level.

Measure Aorta diameter.

Cherriex et al³⁵ study revealed that IVC diameter varies with age, body surface area and dry weight. Son et al³⁶ study suggested that usage

of IVC/Aorta ratio to assess the intravascular volume status to avoid this variation. IVC collapsibility index is used to avoid inspiratory and expiratory variation in IVC.

Normal IVC/Aorta ratio = 0.8 to 1.5

Caval Index = $(IVCe - IVCi) / IVCe * 100$

More than 50% - IVC collapsible

Less than 50% - IVC non collapsible

IVC distensibility is used in mechanically ventilated patients.

IVC Distensibility index = $(\max IVC - \min IVC) / \min IVC$

DI less than 18% - fluid non responsiveness

If IVC/AORTA ratio is low, child's fluid volume status is low and fluid should be given.

If IVC/AORTA ratio is normal, child's fluid volume status is normal. It indicates either shock is corrected or child is fluid refractory based on clinical correlation.

IVC/AORTA ratio is high, child's fluid volume status is high. Child is fluid intolerant and and develop signs of fluid overload.

If IVC is collapsible, there is no fluid overload.

If IVC is full, dilated and non collapsible, child has developed fluid overload.

FREE FLUID IN PERITONEAL CAVITY

FAST ABDOMINAL VIEW

- ❖ Right Costophrenic Recess
- ❖ Hepatorenal Recess.
- ❖ Subdiaphragmatic Space.
- ❖ Inferior Pole of Right Kidney.

Presence of free fluid in the peritoneal cavity indicates fluid overload state , fluid loss in third space and trauma.

LUNGS AND PLEURA:

PROBE: Linear probe (7.5 – 10 mhz)

LOCATION: Mid clavicular line, 3rd – 5th intercostal space

FINDINGS:

- ❖ Normal: Should see lung sliding and no comet tails.
 - M-mode will look like “waves on a beach”.
- ❖ Pneumothorax: No lung sliding and no comet tails.
 - M-mode will look like a “bar graph” (no beach).
- ❖ Pulmonary edema:

- The search of diffuse lung rockets (i.e. multiple B-lines, a comet-tail artifact) is performed. Its presence indicates pulmonary edema.

❖ Free fluid in the pleural space

Presence of pneumothorax indicates obstructive shock. Presence of fluid in the pleural space and multiple B, comet tail artifact indicates early fluid overload.

Adel Hamed Elbaih et al³⁷ studied the comparison of shock index with the CVP and IVC collapsibility index. It was the observational study conducted on 150 patients presented in the ER with the shock tertiary care centre in Egypt. The results of the study were shown below in the table. In this study, the mean CVP of patients in shock was 3.2 ± 2.2 mmHg but the mean IVC-CI was $74.9\% \pm 10.5\%$.

MSI has 100% sensitivity and 98% specificity when the value was >1.3

CVP has 100% sensitivity and specificity when the value was < 8 cmH₂O.

IVC-CI has 100% sensitivity and specificity when collapsibility $\geq 50\%$ in diagnosis of hypovolemia.

Table-4 Correlation Of IVC-CI And MSI

Correlations of IVC-CI with SI and MSI			IVC-CI (%)
Spearman's rho	SI	Correlation coefficient	0.816**
		Sig. (2-tailed)	0.000
		N	100
	MSI	Correlation coefficient	0.826**
		Sig. (2-tailed)	0.000
		N	100

**Correlation is significant at the 0.01 level (2-tailed).

Table-5 IVC collapsibility and CVP correlation:

Parameter	Study group		Significance test
	Mean \pm SD	Median (Min–Max)	
IVCe	1.6 \pm 0.3	1.6 (1–3)	* t = 1.4, P = 0.2
IVCi	0.4 \pm 0.2	0.45 (0–1)	** Z = 8.4, P \leq 0.001
CVP	3.2 \pm 2.2	3 (0–7)	** Z = 8.7, P \leq 0.001
IVC-CI	74.9 \pm 10.5	73 (52–94)	* t = 25.8, P \leq 0.001

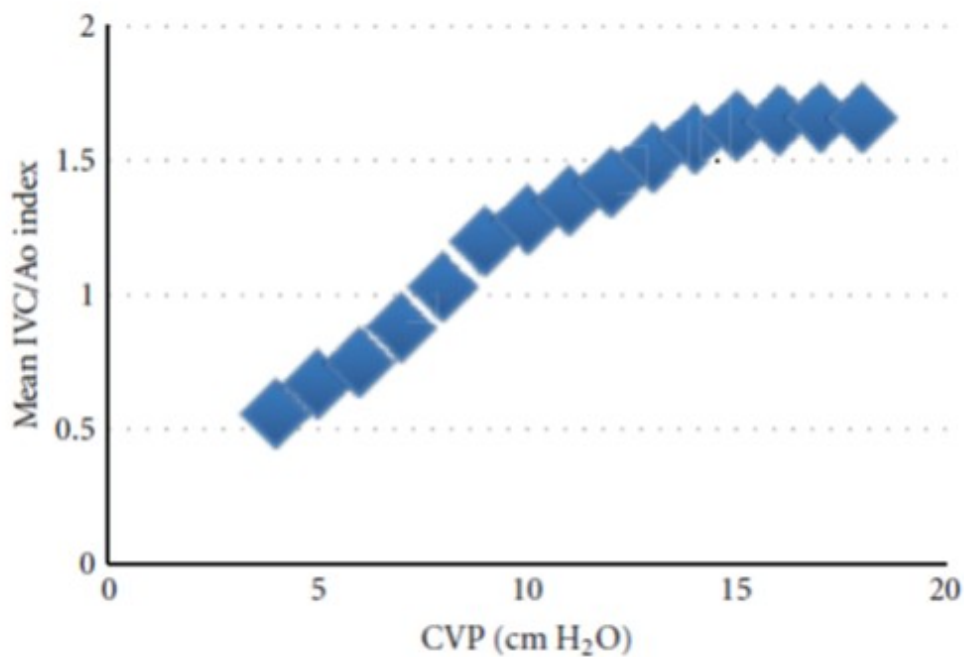
* t of Student's t -test, ** Z of Mann–Whitney test

Harshitha Sridhar et al³⁸ studied the correlation of Aorticaval index with the CVP. The study was conducted in 170 patients in the Emergency Room of Vinayaka Mission Kirupananda Variyar Medical College, Salem. Results were shown in the following table and figure. Time to assess the IVC/Ao was 8 ± 1.5 minutes.

Table-6 CVP And IVC / Aorta Correlation

CVP	Range of IVC/aorta index	Mean IVC/aorta index	Standard deviation
<7 cm H ₂ O	0.56-0.88	0.72	0.09
8-12 cm H ₂ O	1.03-1.42	1.23	0.12
>13 cm H ₂ O	1.51-1.66	1.59	0.05

Figure-5 CI Index And CVP Correlation



Mohammad Reza Ghane et al³⁹ studied about the RUSH examination and its accuracy of diagnosing different types of shock. This study was conducted in 77 patients in tertiary care center in Iran. kappa value was used in that study to study the agreement between preliminary diagnosis and final diagnosis after RUSH exam by ultrasound. The results of the table were shown in the table. Sensitivity, Specificity, Positive predictive value, Negative predictive value of RUSH protocol in diagnosing the type of shock is shown in the table.

Table-7 Rush Protocol And Accuracy

Shock type based on RUSH	Shock Type Based on Final Clinical Diagnosis						Total
	Hypovolemic	Cardiogenic	Obstructive ^a	Distributive ^b	Mixed	Not Defined ^c	
Hypovolemic	16	0	0	1	1	0	18
Cardiogenic	0	18	0	0	1	2	21
Obstructive	0	0	10	0	1	0	11
Distributive	0	0	0	8	0	0	8
Mixed	0	0	0	1	7	6	14
Not defined	0	2	1	1	1	0	5
Total ^d	16 (20.8)	20 (26.0)	11 (14.3)	11 (14.3)	11 (14.3)	8 (10.3)	77

Table-8 Rush Protocol And Diagnostic Accuracy

	Shock Type Based on Final Diagnosis				
	Hypovolemic (n = 16)	Cardiogenic (n = 20)	Obstructive (n = 11)	Distributive (n = 11)	Mixed (n = 11)
Sensitivity	100%	90%	90.9%	72.7%	63.6%
Specificity	96.2%	98%	98.2%	100%	98.2%
PPV ^c	88.9%	94.7%	90.9%	100%	87.5%
NPV	100%	97%	98.3%	95.1%	93.3%
Kappa (PValue)	0.92 (0.000)	0.89 (0.000)	0.89 (0.000)	0.81 (0.000)	0.70 (0.000)

Tanvi et al⁴¹ studied the ultrasound findings in different types of shock. The study showed the ultrasound findings as follows:

Hypovolemic shock-Hyperdynamic heart was 71.8%, A profile in lung was 90%, IVC collapsibility was 100%

Distributive shock- 71.8% have normal LV contractility, A profile in 79.5% IVC collapsible in 79.5%.

Cardiogenic shock- hypodynamic heart LV in 100% of Cases and B profile in lungs USG in 81.1% cases

Obstructive shock- 60% cases had RV strain and 40% cases had cardiac tamponade.

The study also showed the kappa agreement between clinical diagnosis and ultrasound diagnosis.

Kappa agreement value:

Hypovolemic shock- 0.73, substantial agreement

Distributive shock- 0.6, moderate agreement

Cardiogenic shock- 0.79, substantial agreement

Obstructive shock- 1, perfect agreement

M. Ikbal Sasmaz et al⁴⁰ studied about the POCUS protocol. This study was conducted in 180 patients in the Emergency room in Turkey. This study compared the preliminary diagnosis with the final diagnosis by using ultrasound. This study also shows ultrasound findings in all patients with shock.

Table-9 Pocus Findings In Shock Patients

Focused cardiac assessment	Present	
	N	%
Pericardial effusion	17	9,4
Diastolic pressure in right spaces	3	1,1
<i>Left ventricular contractility</i>	Incidence n:	
Hyperdynamic	70	
Normal-slightly decreased	83	
Decreased	27	
<i>Fractioned shortening</i>	Incidence n:	
<%30	27	
%30-%45	71	
>%45	82	
	Present N: %	
Right ventricular hypertrophy	11	6,1
Septal displacement	4	2,2
Dilated aortic root	5	2,7
Intimal flap	0	0
	Present N: %	
Vena cava collapse (caval index > %50)	78	43,4
<i>Focused abdominal and pleural assessment</i>	Present N: %	
Hepatorenal fluid	12	6,7
Right pleural effusion	20	11,1
Splenorenal fluid	2	1,1
Left pleural effusion	17	9,4

Table-10 Kappa Agreement Between Initial And Final Diagnosis Using Pocus

	Preliminary diagnosis before USG		Preliminary diagnosis after USG		<i>p</i> value
	N	%	N	%	
Consistent with definitive diagnosis	109	60,6	153	85	
Inconsistent with definitive diagnosis	71	39,4	27	15	
Total	180	180	180	100	<0.001
Measure of agreement Kappa	Kappa index = 0.564 Moderate agreement		Kappa index = 0.820 Almost perfect agreement		

SHOCK

DEFINITION:

Shock is defined as a cardiovascular dysfunction causing inability to meet metabolic demands of vital organs identified by inadequate perfusion.

PHYSIOLOGY OF SHOCK:

Metabolic derangements:

Inadequate tissue oxygenation lead to tissue hypoxia anaerobic metabolism, accumulation of lactate and pyruvate, tissue acidosis, microcellular derangements and irreversible tissue damage.

Inflammatory mediators:

Hypoperfusion causes activation of humoral mediators and complement cascade. These causes widespread endothelial damage, leucocyte adhesion, pulomary alveolar capillary leak, Acute respiratory distress syndrome and coagulation activation system causing disseminated intravasvular coagulation.

Neurohormonal responses:

They are activated to maintain circulation with compensatory mechanisms.

Cardiovascular response:

Cardiac output is product of stroke volume and heart rate. Heart rate increases to maintain cardiac output. Stroke volume is determined by preload (blood volume), after load (systemic vascular resistance) and myocardial contractility. In hypovolemic shock, there is preload reduction . First compensatory mechanism is vasoconstriction. In septic and neurogenic shock, venous dilatation occurs. This worsens preload deficit . To compensate for this ,Systemic vascular resistance increases to maintain stroke volume.

Renal response:

Hypoperfusuion causes oliguria and results in prerenal failure.

SEVERITY OF SHOCK:

Based on severity , shock is classified into compensated and hypotensive shock.

COMPENSATED SHOCK:

SBP is maintained within normal range despite inadequate tissue perfusion

Table-11 Compensatory Mechanisms In Shock

Compensatory Mechanisms	Tissue/Organ	Signs
Increased Heart rate	Heart	Tachycardia
Increased SVR	Skin	Cold peripheries
	Circulation	Delayed capillary refill
	Pulses	Weak peripheral pulses
Decreased splanchnic blood flow	Kidney	Oliguria
	Intestine	Vomiting ,ileus

HYPOTENSIVE SHOCK:

Systolic BP less than 5th centile for the age. It is near cardiac arrest situation and results in irreversible organ damage.

TYPES OF SHOCK:

- 1) Hypovolemic shock
- 2) Distributive shock (neurogenic/septic shock)
- 3) Cardiogenic shock
- 4) Obstructive shock

HYPOVOLEMIC SHOCK

Pathophysiology:

It is due to the loss of intravascular volume. Some of the causes are diarrhea, haemorrhage, capillary leak (dengue), DKA as a result of

osmotic diuresis, increased insensible water loss (respiratory distress & fever).

Management:

- 1) IV fluid bolus 20ml / kg of crystalloids (NS/RL) over 20 minutes in case of compensated shock.
- 2) In case of hypovolemic shock 20ml/kg pull-push of crystalloids (NS/RL) over 5-10 minutes.

Check for ongoing fluid loss & etiology

DISTRIBUTIVE SHOCK:

Pathophysiology:

Increased peripheral vasodilatation as a result of decreased systemic vascular resistance causing hypovolemia. Some examples are septic shock, anaphylactic shock, neurogenic shock.

There are 3 stages in septic shock.

- ❖ Stage 1: Warm septic shock: SVR is low, peripheral vasodilation present.
- ❖ Stage 2: Cold septic shock: SVR is high, peripheral vasoconstriction causing cool peripheries & decreased perfusion.
- ❖ Stage 3: Cardiac compromise occurs causing myocardial dysfunction.

RISK FACTORS FOR SEPSIS:

- ❖ Young infant
- ❖ Immunocompromised state
- ❖ Structural and functional hyposplenism
- ❖ Severe acute malnutrition and failure to thrive
- ❖ Chronic antibiotic use
- ❖ Chronic steroid use

Causative organisms:

- ❖ Bacteria , fungi, anaerobes and virus

Identification of septic shock:

- ❖ Temperature instability
- ❖ Change in level of consciousness
- ❖ Tachypnea
- ❖ Increased heart rate
- ❖ Peripheries warm, flushed or cool, dusky depending on type of shock
- ❖ Reduced urine output

Fluid refractory shock: Shock present even with CVP more than 12 mmHg and adequate IVC size on ECHO

Fluid intolerance shock: Signs of fluid overload such as respiratory distress, new onset creps, Hepatomegaly.

Management:

- ❖ Stabilize the airway, breathing
- ❖ Antibiotic therapy
- ❖ Fluid resuscitation, watch for signs of fluid intolerance and cardiac dysfunction
- ❖ Appropriate inotrope administration
- ❖ Warm septic shock- Nor adrenaline
- ❖ Cold septic shock with low BP- Adrenaline
- ❖ Cold septic shock with normal BP – Dopamine
- ❖ Steroids in case of inotrope refractory shock.

CARDIOGENIC SHOCK:

Pathophysiology:

Cardiac diseases such as congenital heart disease, cardiomyopathy, myocarditis, arrhythmia causes poor cardiac contractility which in turn results in poor cardiac output.

Management:

- 1) Small aliquots IV fluid bolus of 5-10 ml/kg should be given slowly.
- 2) Appropriate inotropes (Dobutamine or milrinone) required to improve cardiac contractility and decrease SVR
- 3) Cardiac arrhythmia (SVT,VT) should be identified and corrected.
- 4) Metabolic derangements (hypocalcemia, hypokalemia, hyperkalemia, anaemia, infections) should be corrected.

OBSTRUCTIVE SHOCK:

Pathophysiology:

Conditions like tension pneumothorax, cardiac tamponade, massive pulmonary embolism causing obstruction to the cardiac output which results in shock.

Management:

It should be rectified by relieving the obstruction.

- 1) Cardiac tamponade - emergency pericardiocentesis
- 2) Tension pneumothorax – needle decompression followed by thoracostomy.

SUPPORTIVE THERAPY:

- 1) Supplemental oxygen
- 2) Correct Metabolic derangements
- 3) Packed cell transfusion if Hb is <10 gm
- 4) Reduce the metabolic demand by correcting fever, treating pain, relieving anxiety
- 5) Assisted ventilation if required

THERAPEUTIC END POINT OF SHOCK:

- ❖ Stable airway
- ❖ Normal respiration for age
- ❖ HR becomes normal
- ❖ Warm skin CRT ≤ 2 sec
- ❖ Good central & peripheral pulses
- ❖ BP with in normal limits.
- ❖ Normal urine output of \geq to 1ml/kg/hour
- ❖ Decreased serum lactate
- ❖ SCVO₂ \geq to 70%

MATERIALS AND METHODS

STUDY SETTING:

All children admitted in Paediatric ER, Institute of Social Paediatrics, Govt Stanley Medical college with shock.

ETHICAL APPROVAL:

Institutional ethical committee approval was obtained to conduct the study.

STUDY DESIGN:

Cross- Sectional study (Prospective descriptive).

STUDY POPULATION:

103 children with shock

DURATION OF STUDY:

June 2018 to May 2019

CONSENT:

All the guardians of the children were given written informed consent

STUDY POPULATION:

Inclusion Criteria:

All children in the age group of 29 days of life to 12 years of age with shock.

Exclusion Criteria:

- ❖ With other co morbidities like known congenial heart disease, Chronic kidney disease, chronic liver disease, protein losing conditions causing hypoproteinemia, Severe Acute Malnutrition .
- ❖ Children treated elsewhere and who are already on ionotropes will be exclusion.

MATERIALS TO BE USED:

Sonoscape, Ultrasound machine with phased array probe 3.5 to 5 MHZ, Linear probe(7.5 to 10 MHZ)

METHODOLOGY

- ❖ All the patients with shock were selected for the study who are not fitting in the exclusion criteria.
- ❖ Short History obtained from the guardian regarding the cause of the shock, co morbid illness , previous treatment.
- ❖ Clinical assessment- Rapid cardiopulmonary assessment (PEMC Guidelines) done for the child.
- ❖ Categorization of type and severity of shock were done
- ❖ Followed by USG assessment by POCUS protocol²⁸
- ❖ Following parameters were analysed.
 - Heart-cardiac contractility, pericardial effusion

- IVC- diameter, collapsibility
- Aorta- diameter, IVC / aorta ratio
- Free fluid in the peritoneal cavity
- Free fluid in pleural cavity/pneumothorax
- Lung parenchyma-diffuse lung rockets, multiple B profile comet tail artifact.
- ❖ Shock will be managed according to PEMC guidelines
- ❖ Child will be reassessed clinically and ultrasonographically after every management
- ❖ Till recovery from the shock, signs of fluid intolerance and after initiation of inotrope
- ❖ Children were followed by me throughout the hospital stay/upto death.

STATISTICAL METHOD:

Data was analysed using R software Version 3.6.1. All demographics, clinical, ultrasound measurements and types of shock were represented as frequency and percentages. The agreement between clinical parameters with the ultrasound parameters for fluid overloaded cases were assessed using Kappa agreement statistics. The Kappa result be interpreted as follows: values ≤ 0 as indicating no agreement and

0.01–0.20 as none to slight, 0.21–0.40 as fair, 0.41– 0.60 as moderate, 0.61–0.80 as substantial, and 0.81–1.00 as almost perfect agreement.

CONFLICT OF INTEREST

None

PRIVACY/CONFIDENTIALITY OF STUDY SUBJECTS:

Privacy of the subjects maintained.

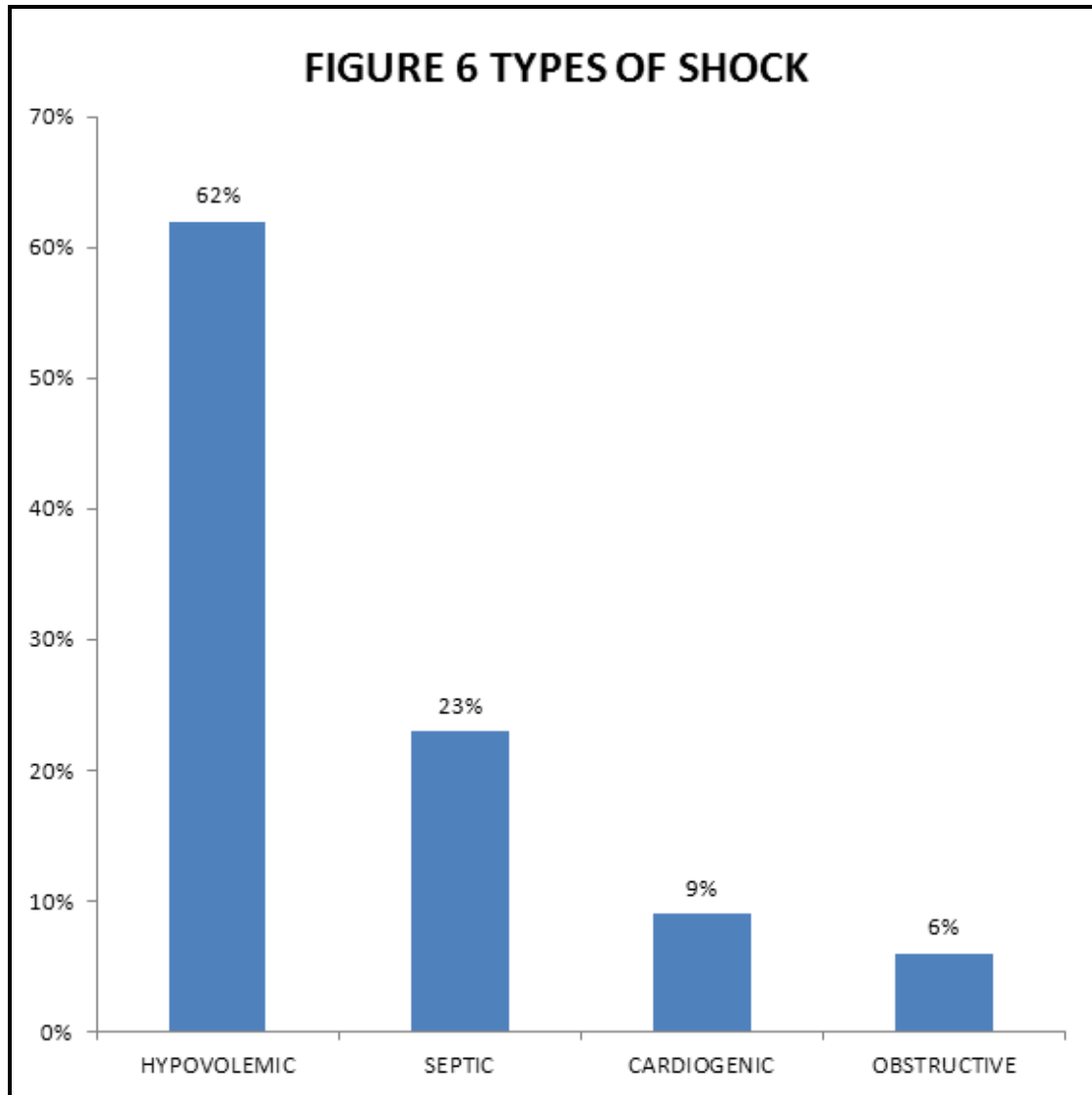
SPONSOR DETAILS

Nil

STATISTICAL ANALYSIS:

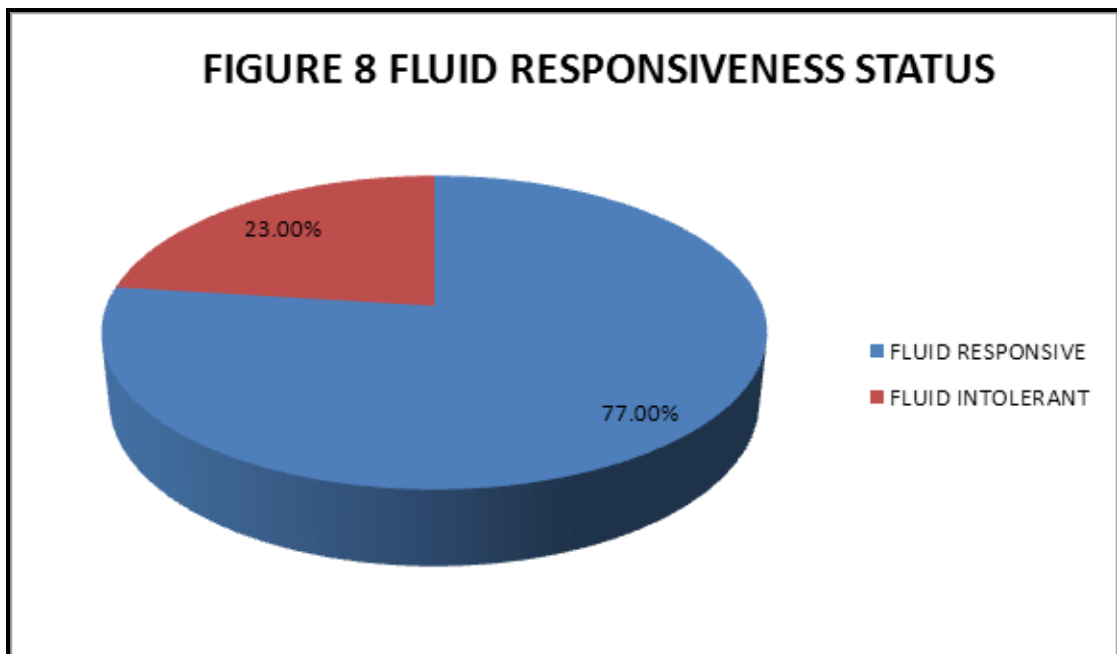
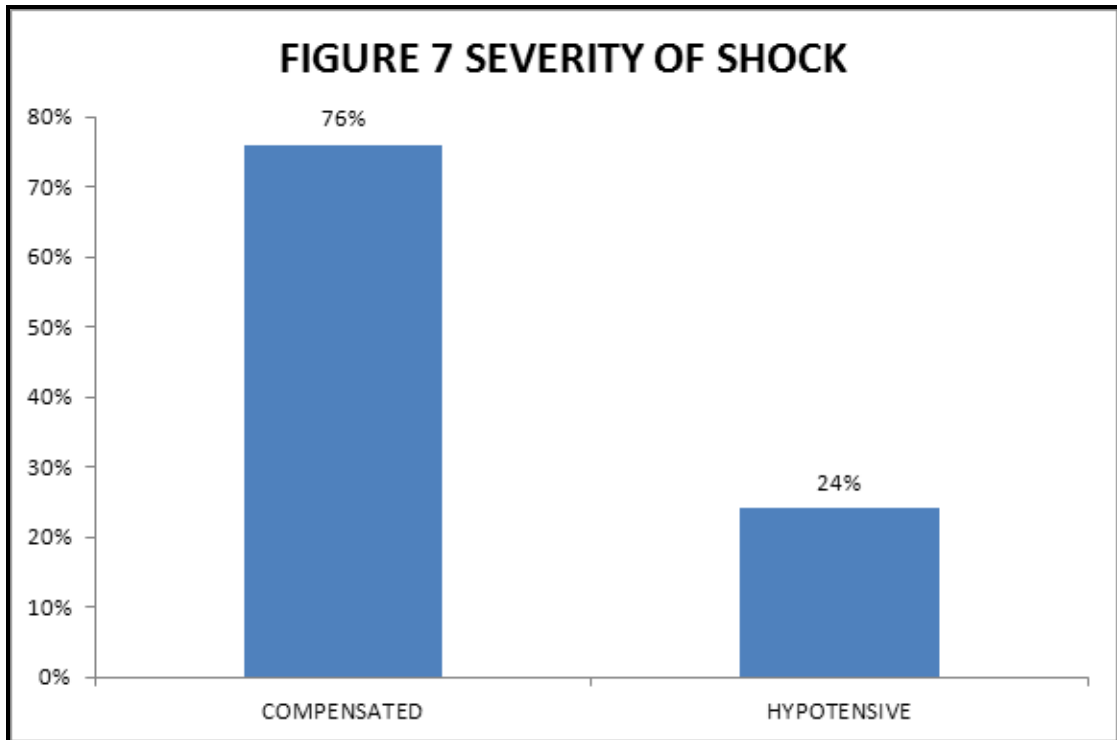
BASIC DEMOGRAPHICS STATISTICS:

- ❖ Total No Of Cases : 129
- ❖ Exclusion Criteria: 26
 - Heart Disease -6
 - Failure to Thrive/Severe acute malnutrition- 10
 - ARDS -1
 - Inborn errors of metabolism- 2
 - CKD -1
 - Liver Disease -4
 - Malignancy -2
- ❖ Cases Included In The Study: 103

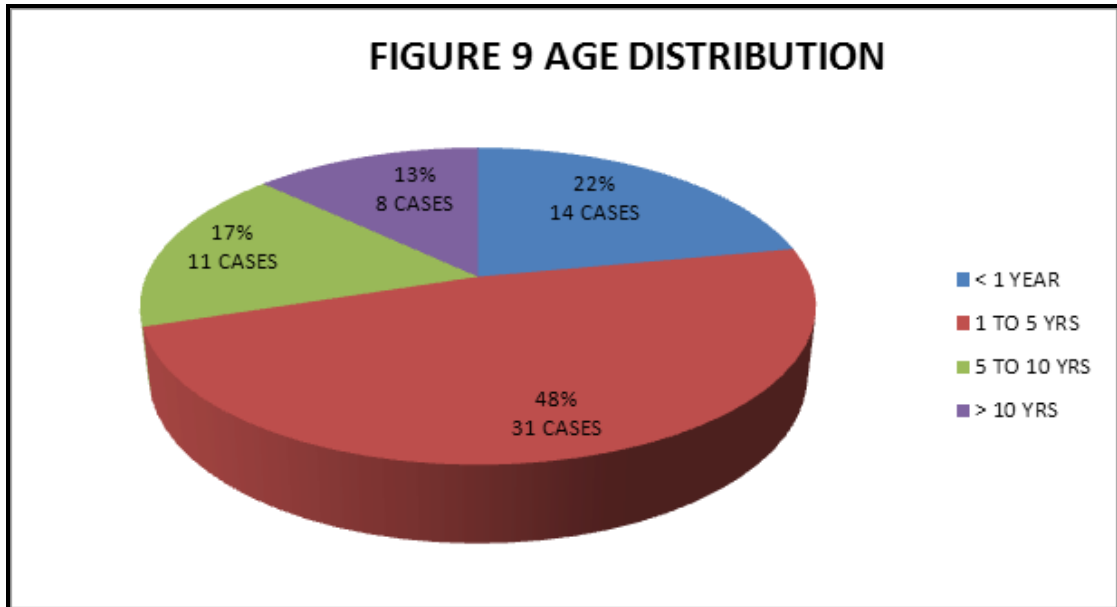


Among 103 cases included in the study, 64 cases (62%) had hypovolemic shock.

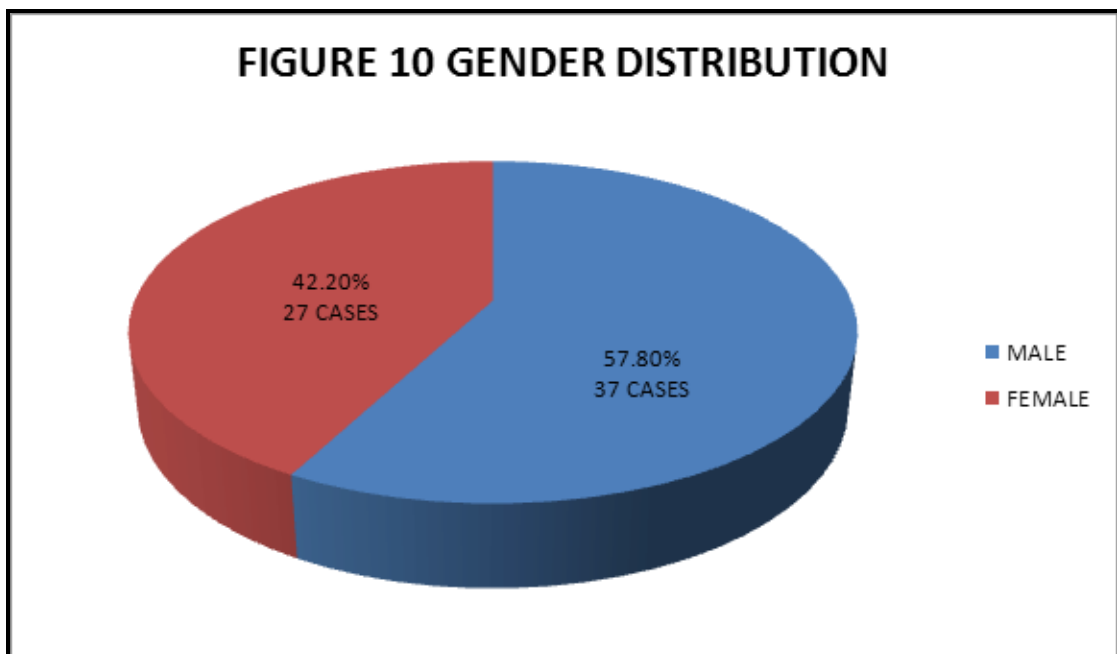
24 cases (23%) had septic shock. 9 cases (9%) & 6 cases (6%) had cardiogenic and obstructive shock respectively. Among these 103 cases 78 cases (76%) had compensated shock and 25 cases (24%) had hypotensive shock .



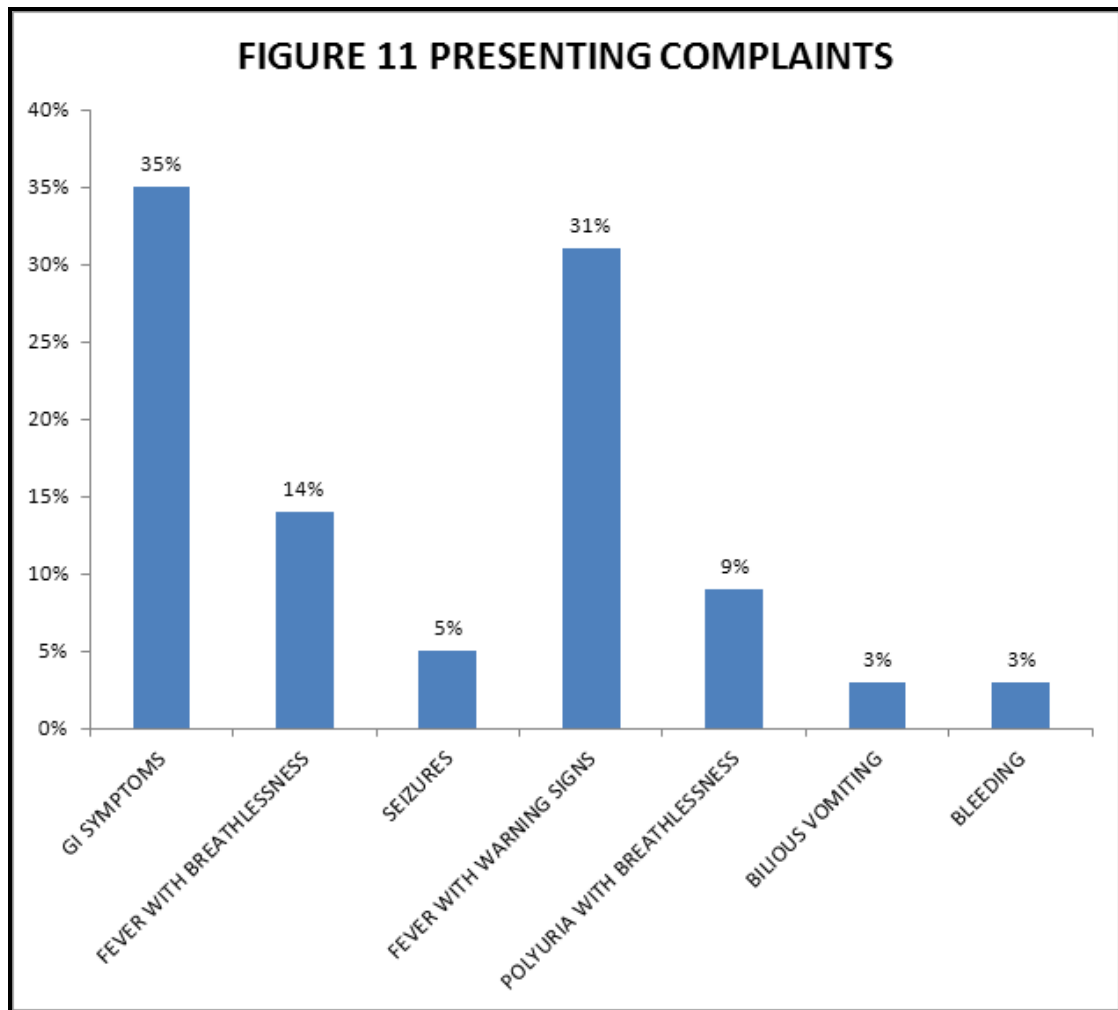
Among 103 cases, 23% (24 cases) were fluid intolerant and 77% (79 cases) were fluid responsive.



Among 64 cases, age of less than 1 year constituted 22% (14 cases), age between 1 to 5 years constituted 48% (31 cases), age between 5 to 10 years constituted 17% (11 cases), age more than 10 years constituted 13% (8 cases).



57.8% of cases were male and 42.2% were female in the hypovolemic study group.



In the 64 cases, 22 cases (35%) presented with loose stools & vomiting. 20 cases (31%) presented with fever with warning signs, 9 cases (14 %) with fever & breathlessness. 6 cases (9%) with polyuria, 3 cases (5%) with seizures, 2 cases (3%) with bilious vomiting, 2 cases (3%) with bleeding.

Table-12: Clinical Assessment In Hypovolemic Shock:

CLINICAL PARAMETERS	FREQUENCY (n=64)	PERCENTAGE (%)
AIRWAY		
STABLE	55	85.9
UNSTABLE	9	14.1
RESPIRATORY RATE		
TACHYPNEA	52	80
NORMAL	3	5
NOT APPLICABLE	9	15
AIR ENTRY (n=55)		
NORMAL	49	89
DECREASED	6	11
ADDED SOUNDS		
NIL	58	90.6
CREPS	6	9.4
HEART RATE		
NORMAL	7	10
TACHYCARDIA	57	90
HEART SOUNDS		
NORMAL	64	100
MUFFLED	0	0
MURMUR	0	0
GALLOP	0	0

CLINICAL PARAMETERS	FREQUENCY (n=64)	PERCENTAGE (%)
PULSE VOLUME		
3+/1+	48	75
2+/0	16	25
CAPILLARY REFILLING TIME		
<3 SEC	2	3
>3 SEC	62	97
LIVER SPAN		
NORMAL	58	90
INCREASED	6	10
BLOOD PRESSURE		
NORMAL	21	32.8
INCREASED	27	42.2
DECREASED	16	25
AVPU SCALE		
NORMAL	20	32
ALOC	44	68

Table-13 USG Findings In Hypovolemic Shock

USG PARAMETERS	FREQUENCY (n=64)	PERCENT AGE
PERICARDIAL EFFUSION		
PRESENT	0	0
ABSENT	64	100
LV CONTRACTILITY		
NORMAL	14	21.8
DECREASED	0	0
INCREASED	50	78.2
RV CONTRACTILITY		
NORMAL	64	100
DIASTOLIC RV COLLAPSE	0	0
IVC/AORTA RATIO		
NORMAL(0.8 – 1.5)	6	9
DECREASED(<0.8)	58	91
INCREASED(>1.5)	0	0
IVC COLLAPSABILITY		
>50% COLLAPSIBLE	64	100
<50% NON COLLAPSIBLE	0	0
LUNGS		
NORMAL - A PROFILE	64	100
PLERUAL EFFUSION	12	19
INTERSTITIAL EDEMA- B PROFILE	0	0
PNEUMOTHORAX- ABSENT SLIDING SIGN	0	0
FREE FLUID ABDOMEN		
PRESENT	9	14
ABSENT	55	86

USG FINDINGS IN HYPOVOLEMIC SHOCK

HEART:

There was no pericardial effusion in all 64 cases. LV contractility were hyperdynamic in 50 cases (78.2%), normal in 14 cases (21.8%), RV contractility were normal in all cases.

IVC /AORTA RATIO:

It was decreased (≤ 0.8) in 58 cases (91%), normal (0.8 to 1.5) in 6 cases (9%)

IVC COLLAPSIBILITY:

All 64 cases had IVC collapsibility more than 50%.

LUNGS:

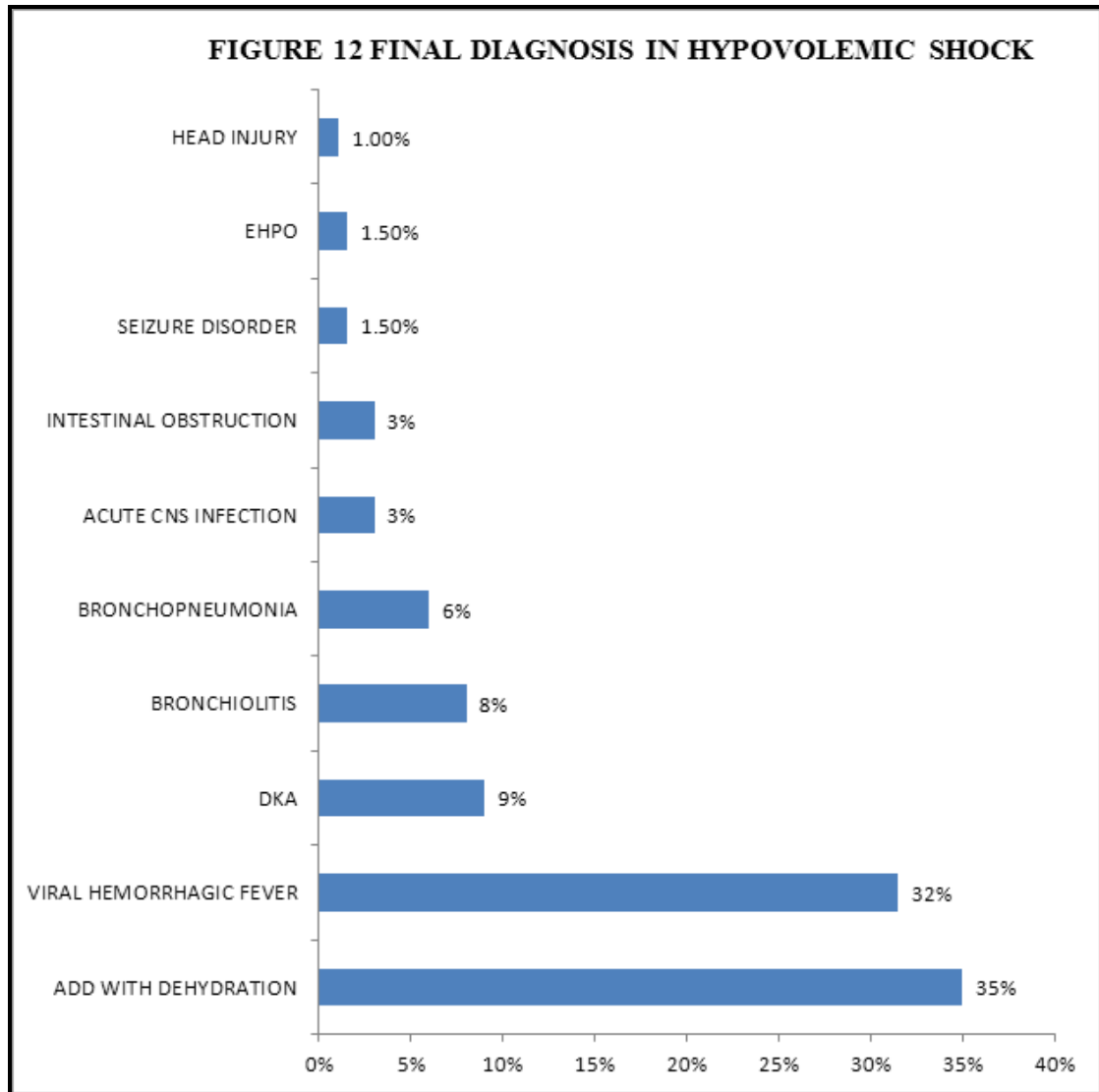
64 cases (100%) had A profile, 12 cases (18%) had right sided pleural effusion. All the 12 cases with pleural effusion presented as fever with warning signs & had viral hemorrhagic shock.

FREE FLUID ABDOMEN:

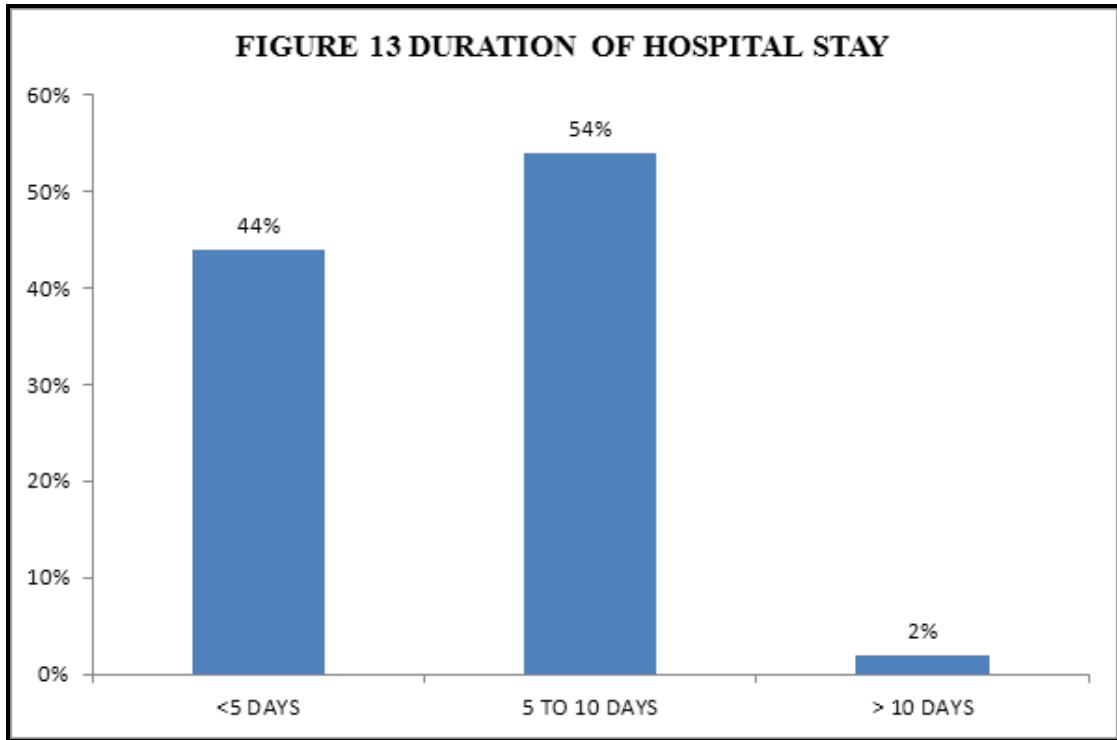
55 cases (86%) had no free fluid abdomen, 9 cases (14%) had ascites.

INOTROPES REQUIREMENT:

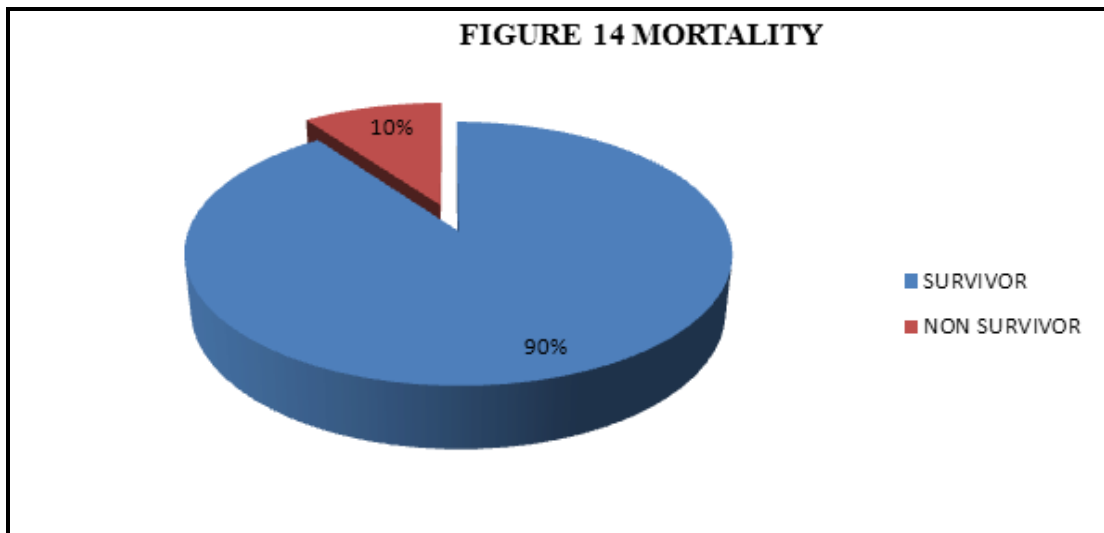
5 cases required inotrope usage. Among these 5 cases, 3 cases required after 4th bolus and 2 cases required after 3rd bolus.



Final diagnosis of patients were ADD with dehydration in 35% (22 cases), viral hemorrhagic shock syndrome in 31% (20 cases), Diabetic ketoacidosis in 9% (6 cases), bronchiolitis in 8% (5 cases), bronchopneumonia in 6% (4 cases), acute CNS infection in 3% (2 cases), intestinal obstruction in 3% (2 cases). seizure disorder, extra hepatic portal vein obstruction, head injury in 1 case each constituting 1.5% .

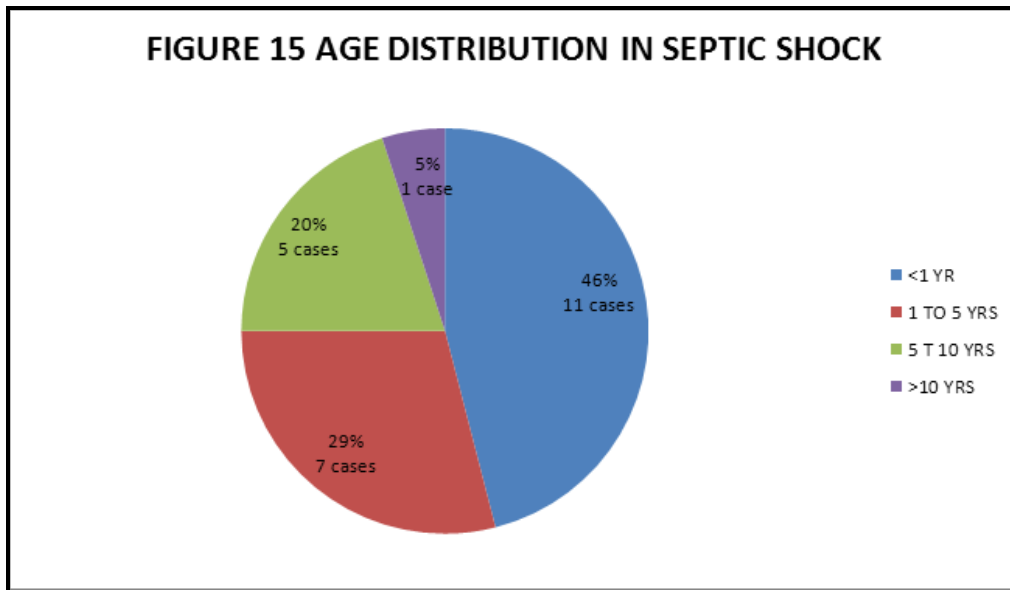


Duration of hospital stay was less than 5 days in 28 cases (44%), 5 to 10 days in 35 cases (54%), more than 10 days in 1 case (2%).

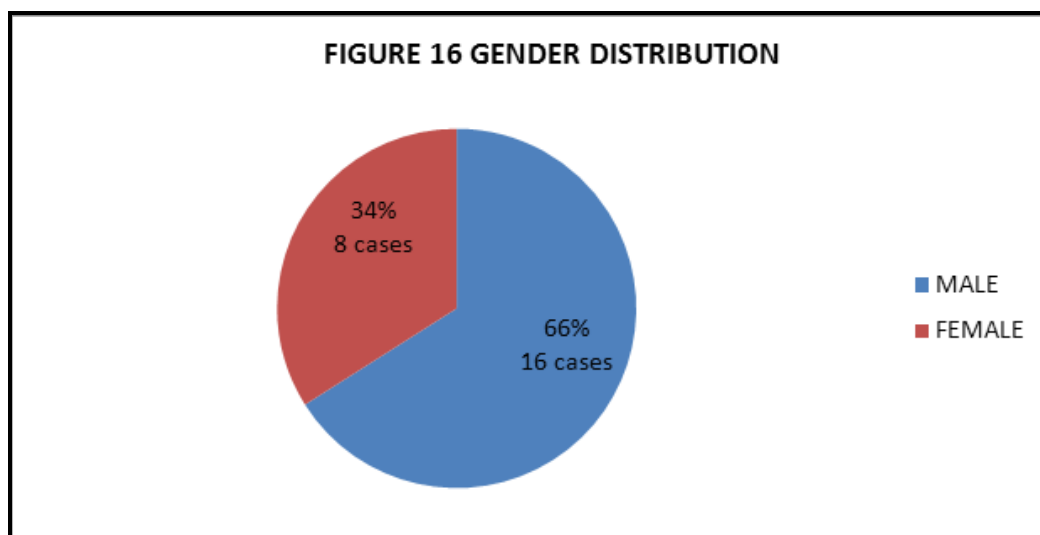


Mortality in hypovolemic shock was 10 % (7 cases).

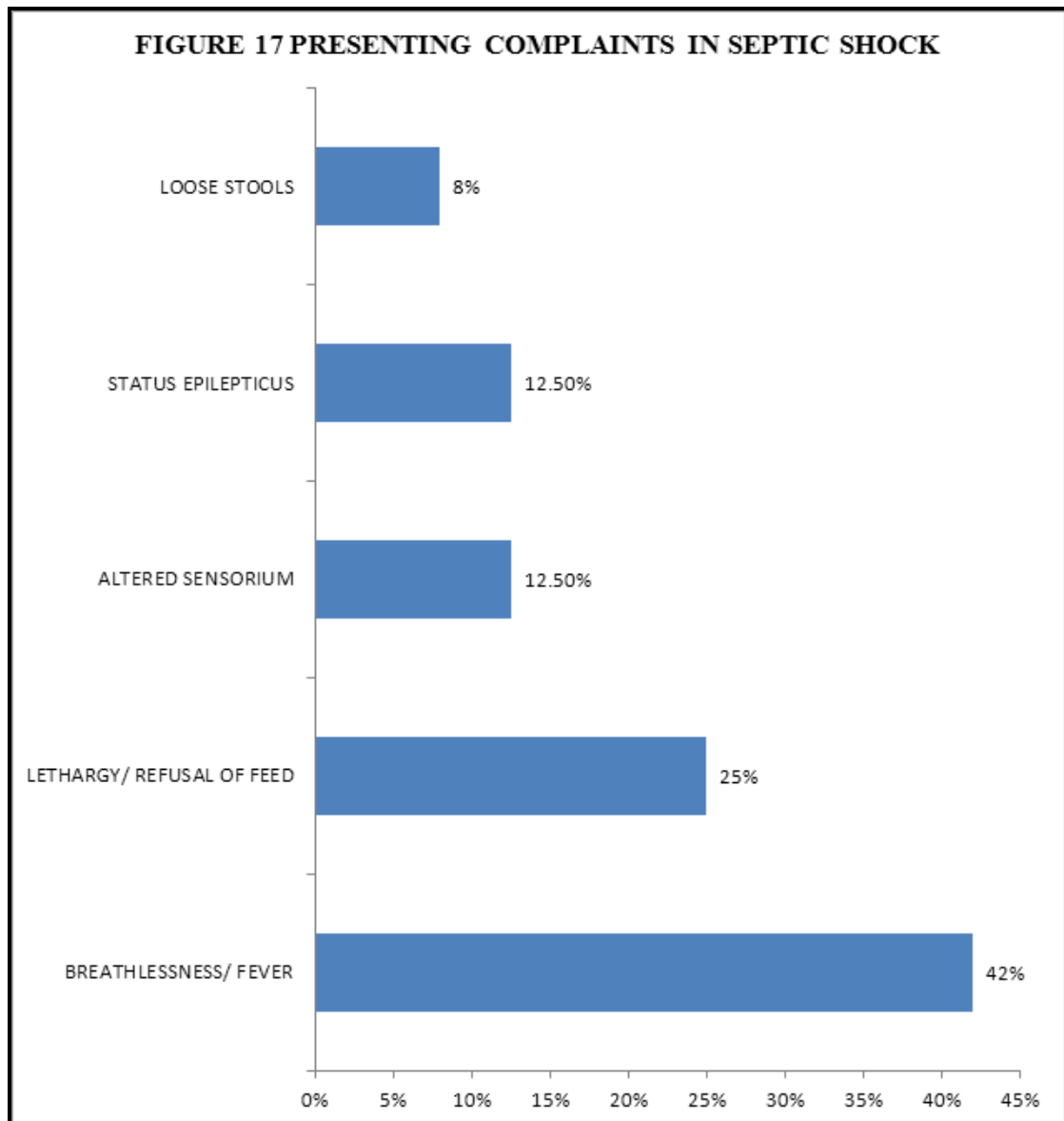
SEPTIC SHOCK:



Among 24 cases, age of less than 1 year constituted 46% (11 cases), age between 1 to 5 years constituted 29% (7 cases), age between 5 to 10 years constituted 20% (5 cases), age more than 10 years constitutes 5% (1 case).



66% (16 cases) of cases were male and 34% (8 cases) were female in the septic shock study group.



Among 24 cases 42% (10 cases) presented as fever with breathlessness,

25% (6 cases) as lethargy / refusal of feeds,

12.5 % (3 cases) with altered sensorium,

12.5% (3 cases) with status epilepticus ,

8% (2cases) with loose stools.

Table-14: Clinical Assessment In Septic Shock:

CLINICAL PARAMETERS	FREQUENCY (n=24)	PERCENTAGE
AIRWAY		
STABLE	20	84
UNSTABLE	4	16
RESPIRATORY RATE		
TACHYPNEA	17	71
NORMAL	3	13
NOT APPLICABLE	4	16
ADDED SOUNDS		
NO ADDED SOUNDS	19	79
CREPS	5	21
AIR ENTRY		
NORMAL	22	87
DECREASED	2	13
HEART RATE		
NORMAL	0	0
TACHYCARDIA	24	100
HEART SOUNDS		
NORMAL	24	100
MUFFLED	0	0
MURMUR	0	0
GALLOP	0	0

CLINICAL PARAMETERS	FREQUENCY (n=24)	PERCENTAGE
PULSE VOLUME		
3+/1+	4	16.6
2+/0	4	16.6
3+/3+	16	66.8
CAPILLARY REFILLING TIME		
<3 SEC	0	0
>3 SEC	8	33
FLASH CRT	16	67
LIVER SPAN		
NORMAL	20	83
INCREASED	4	17
BLOOD PRESSURE		
NORMAL	10	41.6
INCREASED	10	41.6
DECREASED	4	16.8
AVPU SCALE		
NORMAL	4	17
ALOC	20	83

Table-15 USG Findings In Septic Shock

USG PARAMETERS	FREQUENCY (n=24)	PERCENTAGE
PERICARDIAL EFFUSION		
PRESENT	0	0
ABSENT	24	100
LV CONTRACTILITY		
NORMAL	5	20.8
DECREASED	0	0
INCREASED	19	79.2
RV CONTRACTILITY		
NORMAL	24	100
DIASTOLIC RV COLLAPSE	0	0
IVC/AORTA RATIO		
NORMAL(0.8-1.5)	3	12.5
DECREASED(<0.8)	21	87.5
INCREASED(>1.5)	0	0
IVC COLLAPSABILITY		
>50% COLLAPSIBLE	24	100
<50% NON COLLAPSIBLE	0	0
LUNGS		
NORMAL - A PROFILE	24	100
PLERUAL EFFUSION	0	0
INTERSTITIAL EDEMA- B PROFILE	0	0
PNEUMOTHORAX- ABSENT SLIDING SIGN	0	0
FREE FLUID ABDOMEN		
PRESENT	0	0
ABSENT	24	100

USG FINDINGS IN SEPTIC SHOCK:

HEART:

There was no pericardial effusion in all 24 cases. LV contractility were hyperdynamic in 19 cases (79.2%), normal in 5 cases (20.8%), RV contractility were normal in all cases.

IVC /AORTA RATIO:

It was decreased(≤ 0.8) in 21 cases (87.5%), normal (0.8 to 1.5) in 3 cases (12.5%)

IVC COLLAPSIBILITY:

All 24 cases had IVC collapsibility more than 50%.

LUNGS:

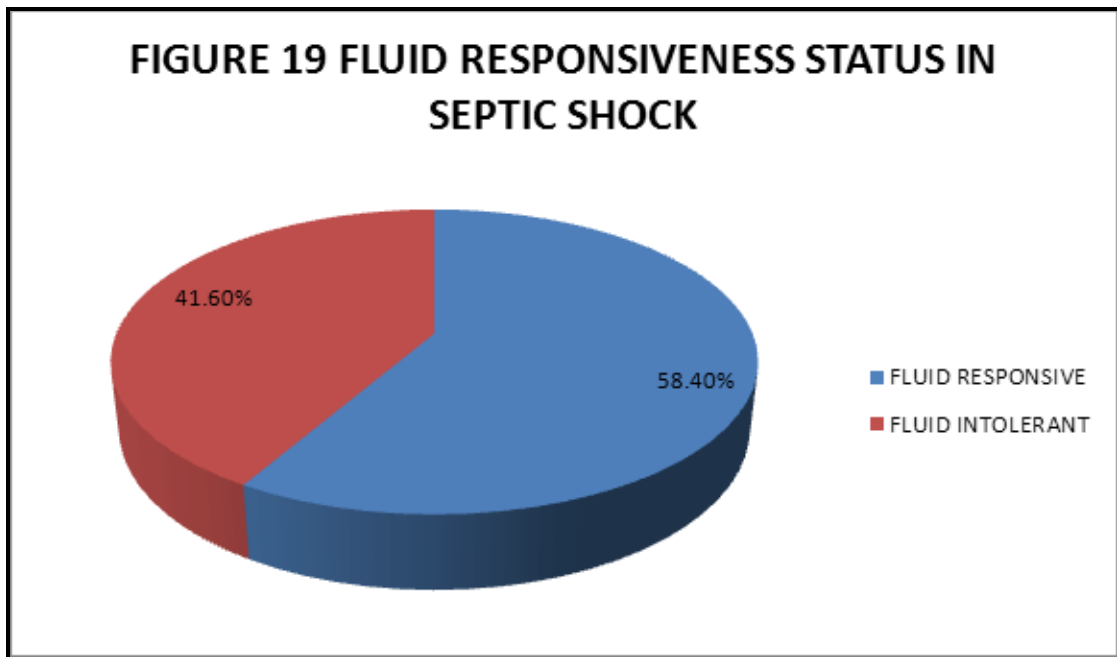
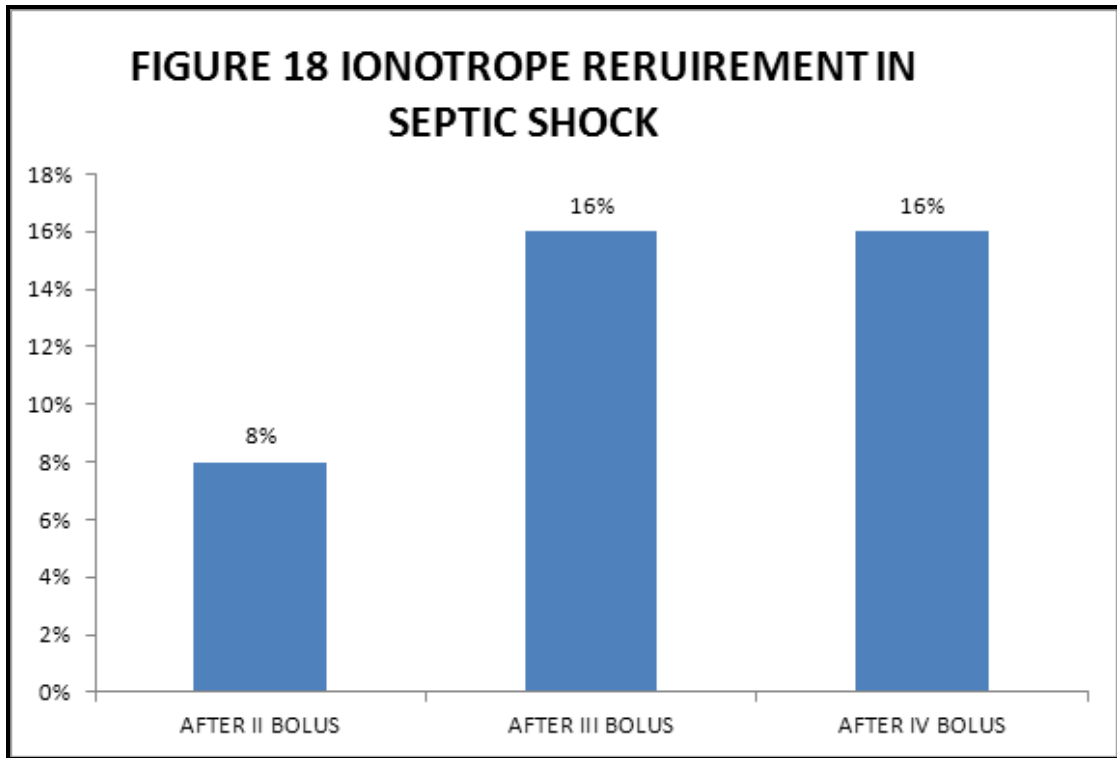
All 24 cases had normal A profile in lung USG finding (sliding sign).

FREE FLUID ABDOMEN:

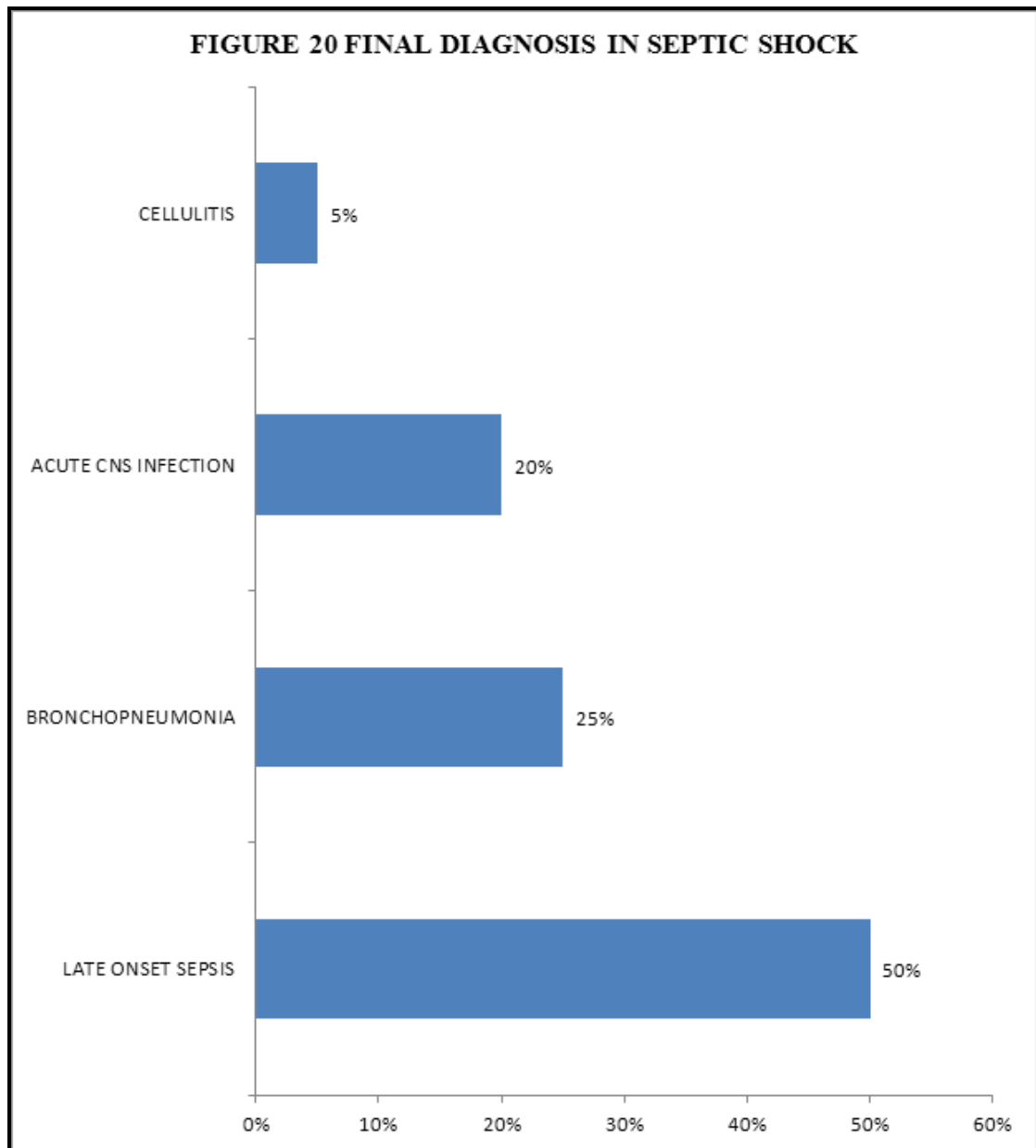
No free fluid abdomen in all the cases.

INOTROPES REQUIREMENT:

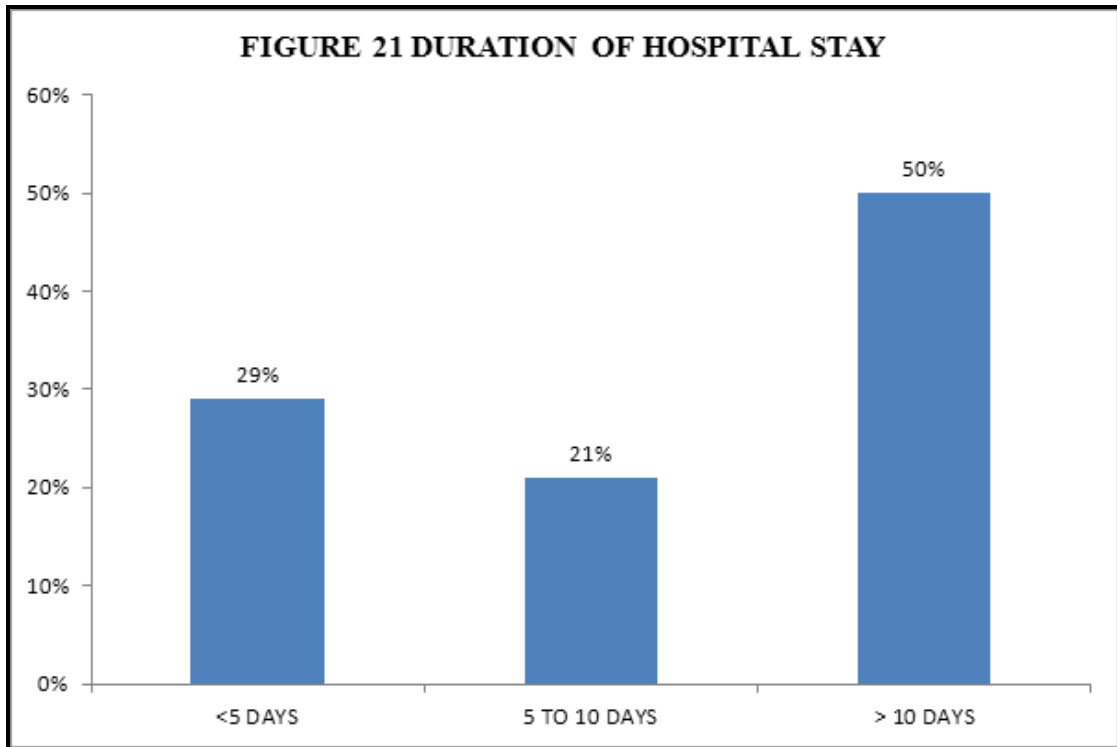
Total of 10 cases (41.6%) required inotrope usage. Among these 10 cases, 4 cases (16%) required after 4th bolus, 4 cases (16%) required after 3rd bolus, 2 cases (8%) required after 2nd bolus.



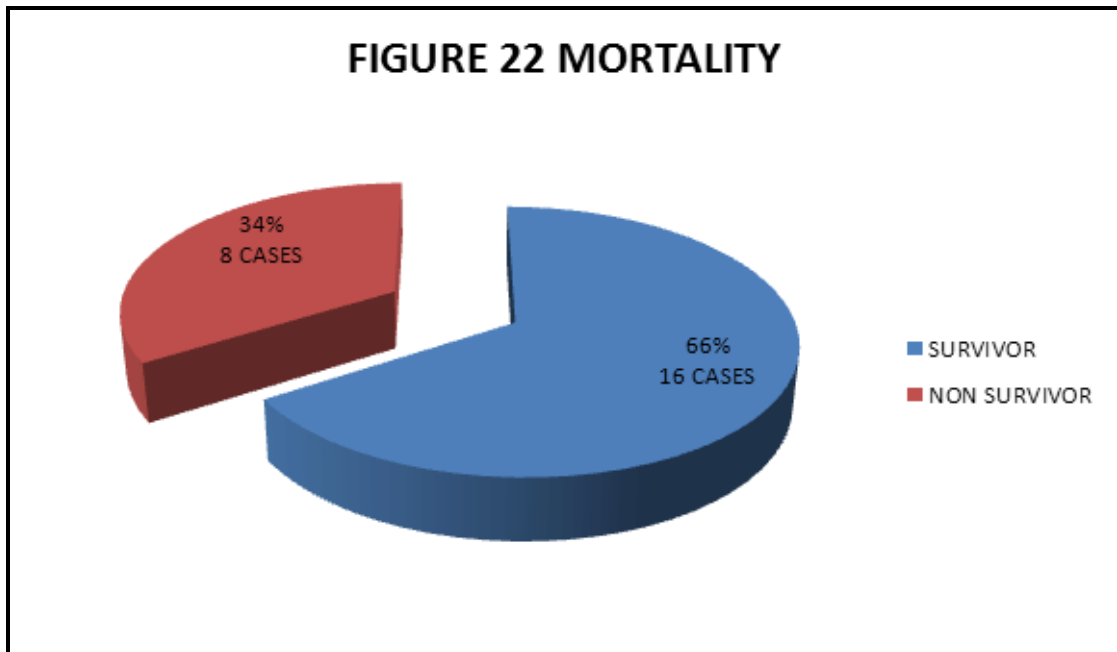
Among the 24 septic shock cases, 58.4%(14 cases) were fluid responsive and 41.6%(10 cases) were fluid intolerant.



Final diagnosis was late onset sepsis in 50%(12 cases), bronchopneumonia in 25%(6 cases), acute CNS infection in 20%(5%), lower limb cellulitis in 5% (1 case).

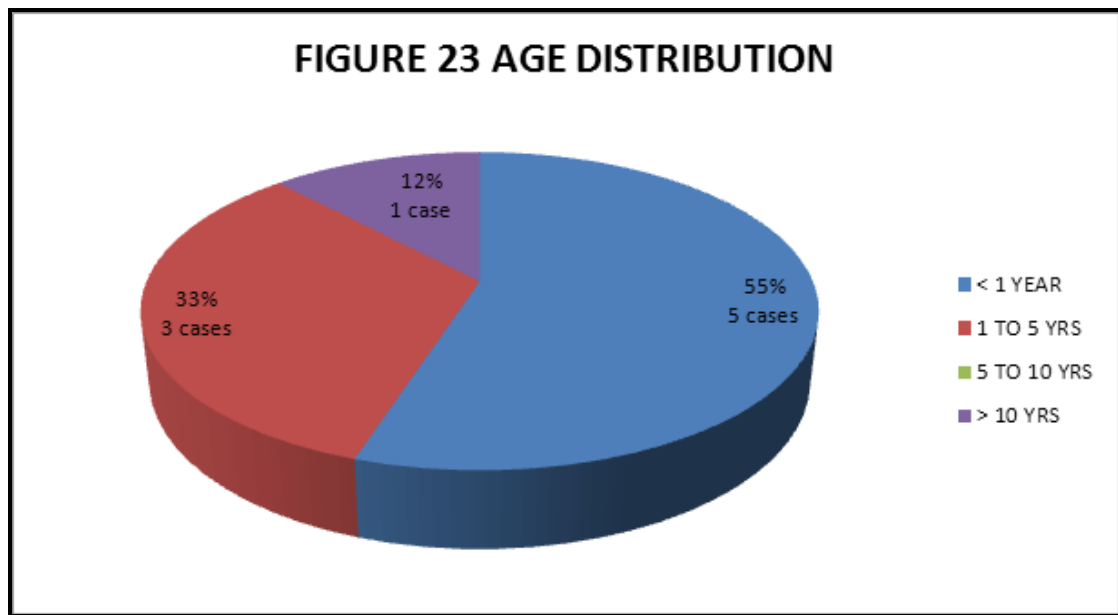


Duration of hospital stay was less than 5 days in 7 cases (29%), 5 to 10 days in 5 cases (21%), more than 10 days in 12 case (50%).

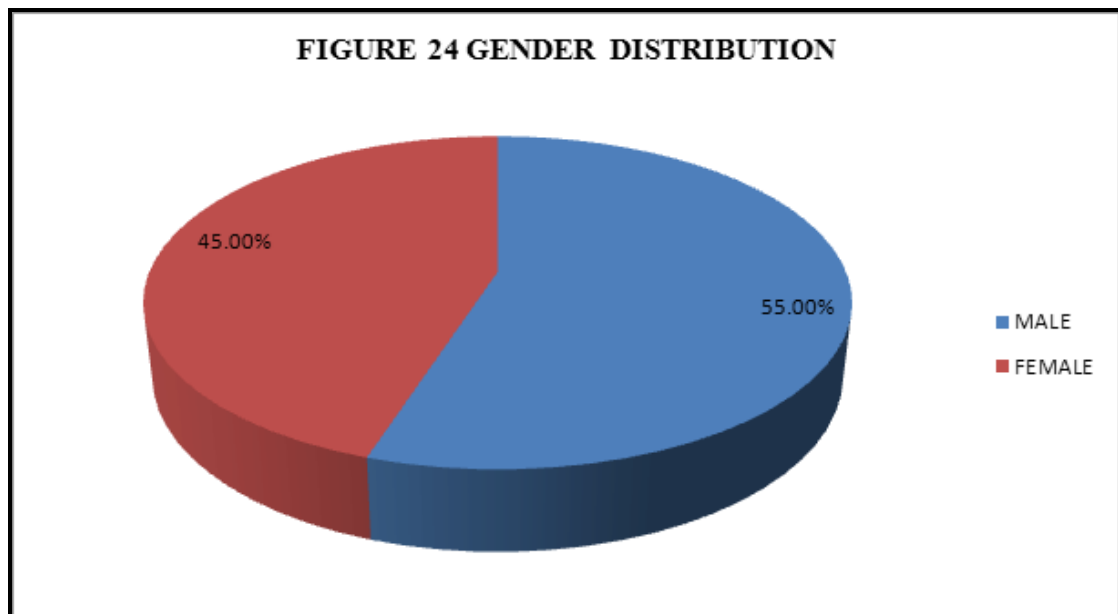


Mortality in septic shock was 34 % (8 cases).

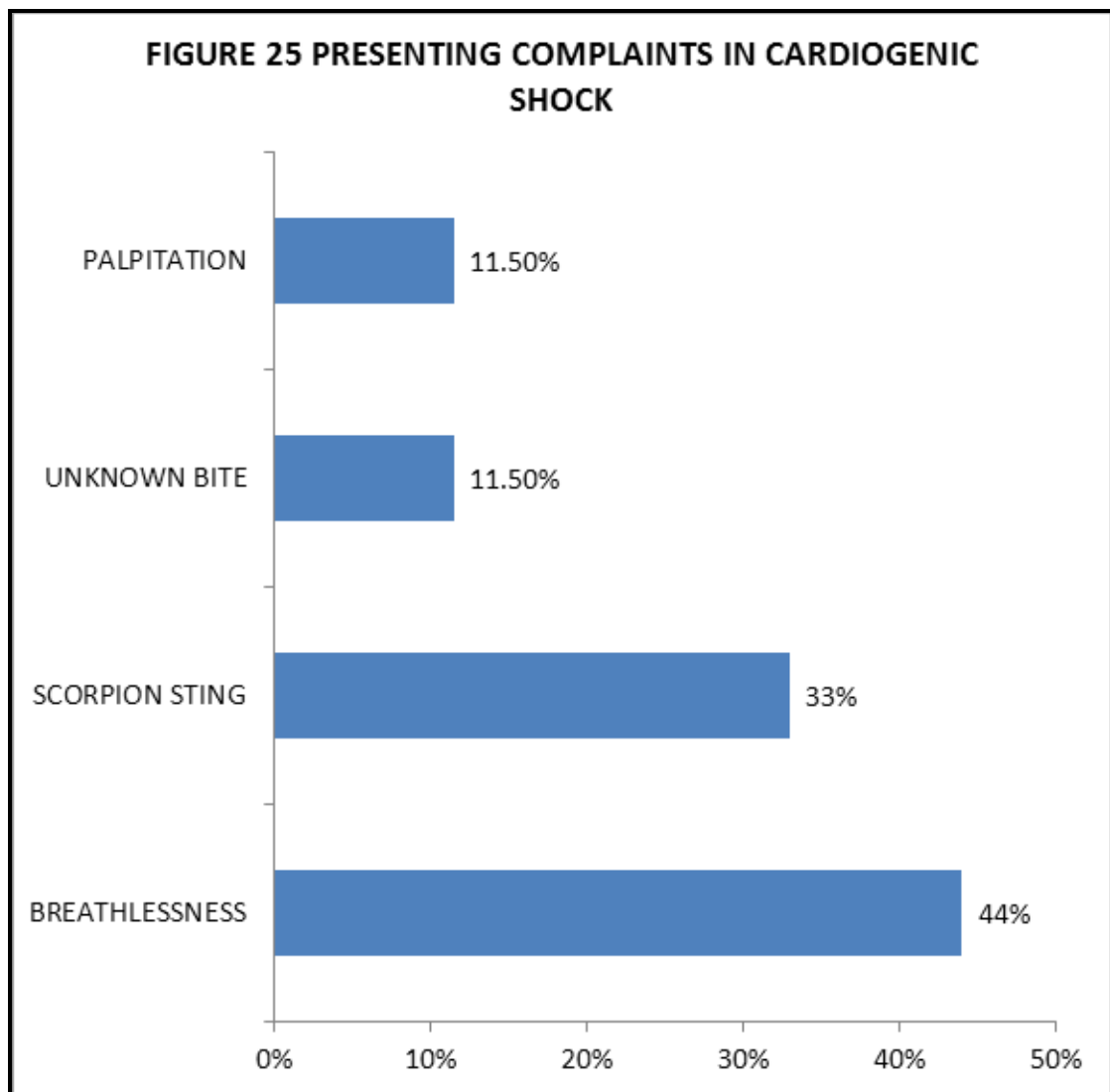
CARDIOGENIC SHOCK:



Among 9 cases, age of less than 1 year constituted 55% (5 cases), age between 1 to 5 years constituted 33% (3 cases), age more than 10 years constituted 9% (1 case).



55% (5 cases) of cases were male and 45% (4 cases) were female in the cardiogenic shock study group.



Among 9 cases 44% (4 cases) presented with breathlessness, 33% (3 cases) presented with scorpion sting, 11.5% (1 case) with unknown bite and 11.5 % (1 case) with palpitation.

Table-16: Clinical Assessment In Cardiogenic Shock

CLINICAL PARAMETERS	FREQUENCY (n=9)	PERCENTAGE
AIRWAY		
STABLE	9	100
UNSTABLE	0	0
RESPIRATORY RATE		
TACHYPNEA	9	100
NORMAL	0	0
ADDED SOUNDS		
NO ADDED SOUNDS	4	45
CREPS	5	55
AIR ENTRY		
NORMAL	9	100
DECREASED	0	0
HEART RATE		
NORMAL	0	0
TACHYCARDIA	9	100
HEART SOUNDS		
NORMAL	3	33
MUFFLED	0	0
MURMUR	2	22
GALLOP	4	45
PULSE VOLUME		
3+/1+	4	45
2+/0	5	55

CLINICAL PARAMETERS	FREQUENCY (n=9)	PERCENTAGE
CAPILLARY REFILLING TIME		
<3 SEC	9	100
>3 SEC	0	0
LIVER SPAN		
NORMAL	0	0
INCREASED	9	100
BLOOD PRESSURE		
NORMAL	0	0
INCREASED	4	45
DECREASED	5	55
AVPU SCALE		
NORMAL	2	22
ALOC	7	78

Table-17: USG Findings In Cardiogenic Shock

USG PARAMETERS	FREQUENCY (n=9)	PERCENTAGE
PERICARDIAL EFFUSION		
PRESENT	0	0
ABSENT	9	100
LV CONTRACTILITY		
NORMAL	0	0
DECREASED	9	100
INCREASED	0	0
RV CONTRACTILITY		
NORMAL	9	100
DIASTOLIC RV COLLAPSE	0	0
IVC/AORTA RATIO		
NORMAL(0.8-1.5)	0	0
DECREASED(<0.8)	0	0
INCREASED(>1.5)	9	100
IVC COLLAPSABILITY		
>50% COLLAPSIBLE	0	0
<50% NON COLLAPSIBLE	9	100
LUNGS		
NORMAL - A PROFILE	3	33
PLERUAL EFFUSION	0	0
INTERSTITIAL EDEMA- B PROFILE	6	67
PNEUMOTHORAX- ABSENT SLIDING SIGN	0	0
FREE FLUID ABDOMEN		
PRESENT	0	0
ABSENT	9	100

USG FINDINGS IN CARIOGENIC SHOCK:

HEART:

There was no pericardial effusion in all 9 cases. LV contractility were decreased (EF < 30%), RV contractility were normal in all cases.

IVC /AORTA RATIO:

It was more than 1.5 in all the cases.

IVC COLLAPSIBILITY:

In all cases IVC was non- collapsible. (Collapsibility less than 50%).

LUNGS:

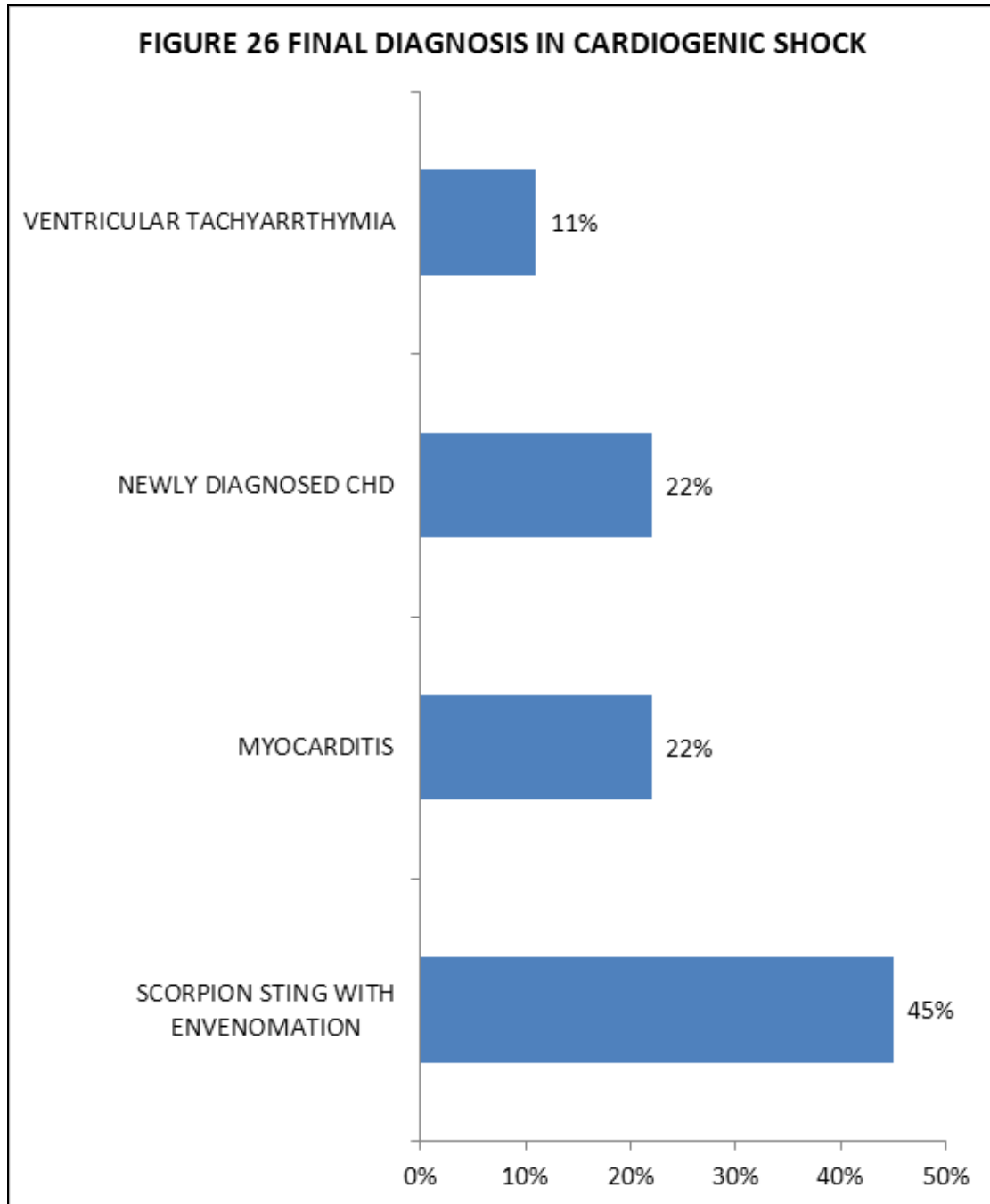
3 cases (33%) had A profile in Lung USG, 6 cases (67%) had B profile

FREE FLUID ABDOMEN:

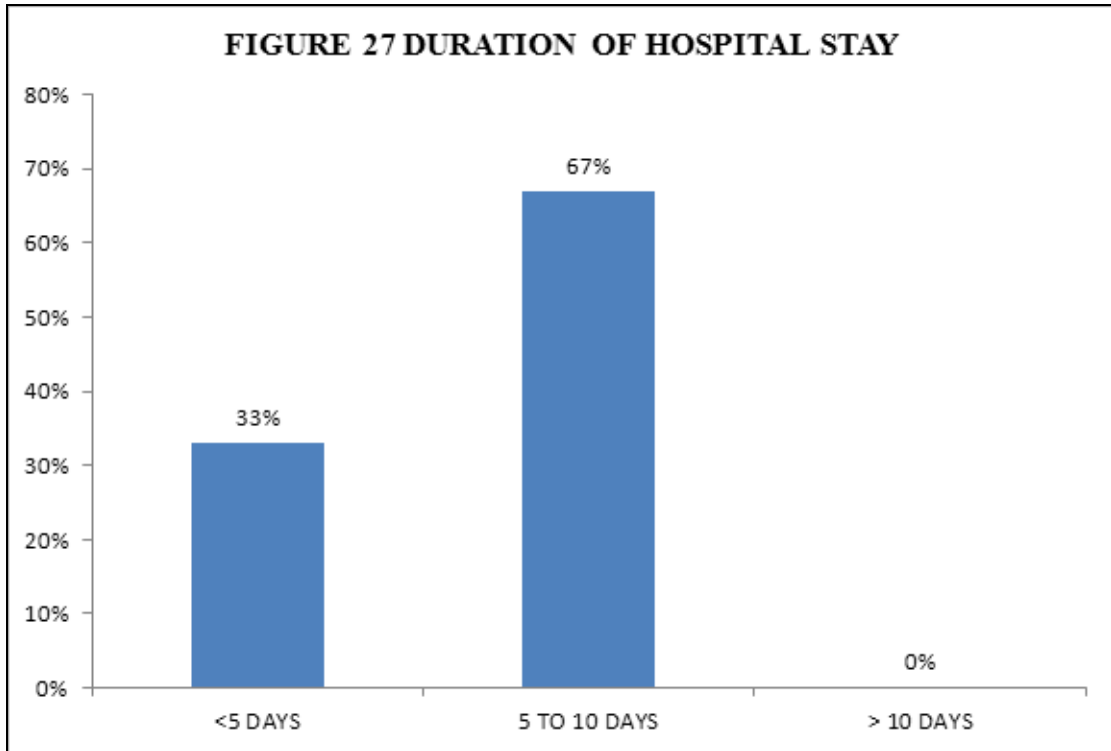
No free fluid abdomen in all the cases.

INOTROPES REQUIREMENT:

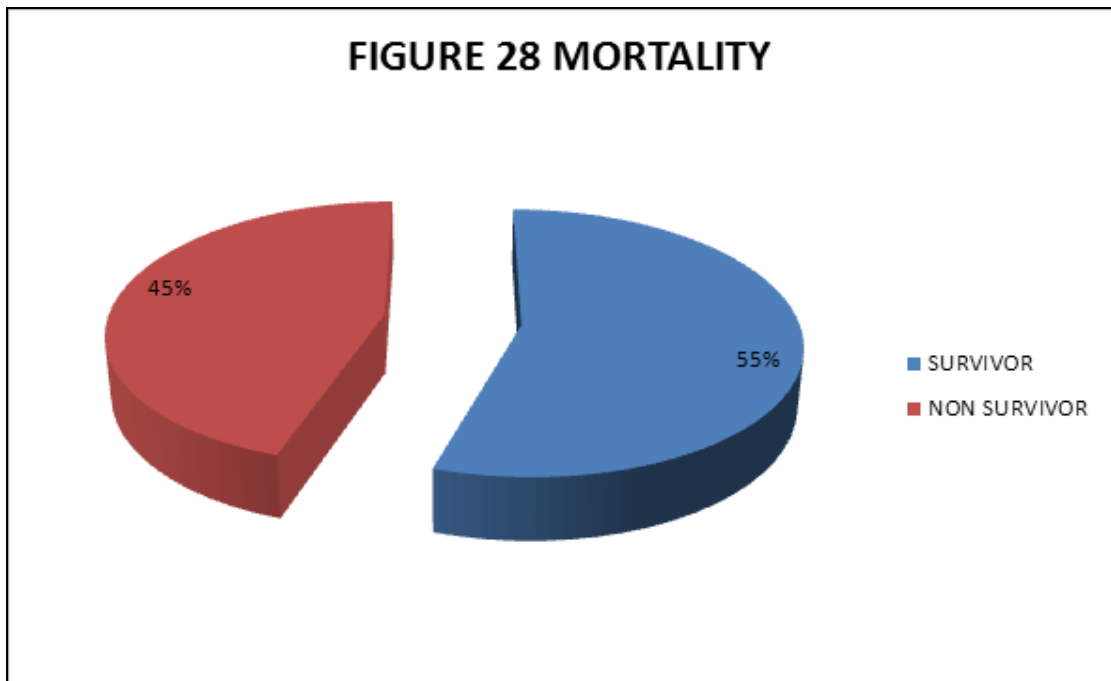
All the 9 cases required inotrope usage.



Among 9 cases final diagnosis was scorpion sting with envenomation in 4 cases (45%), myocarditis in 2 cases (22%), newly diagnosed congenital heart disease in 2 cases (22%), ventricular tachyarrhythmia in 1 case (11%).

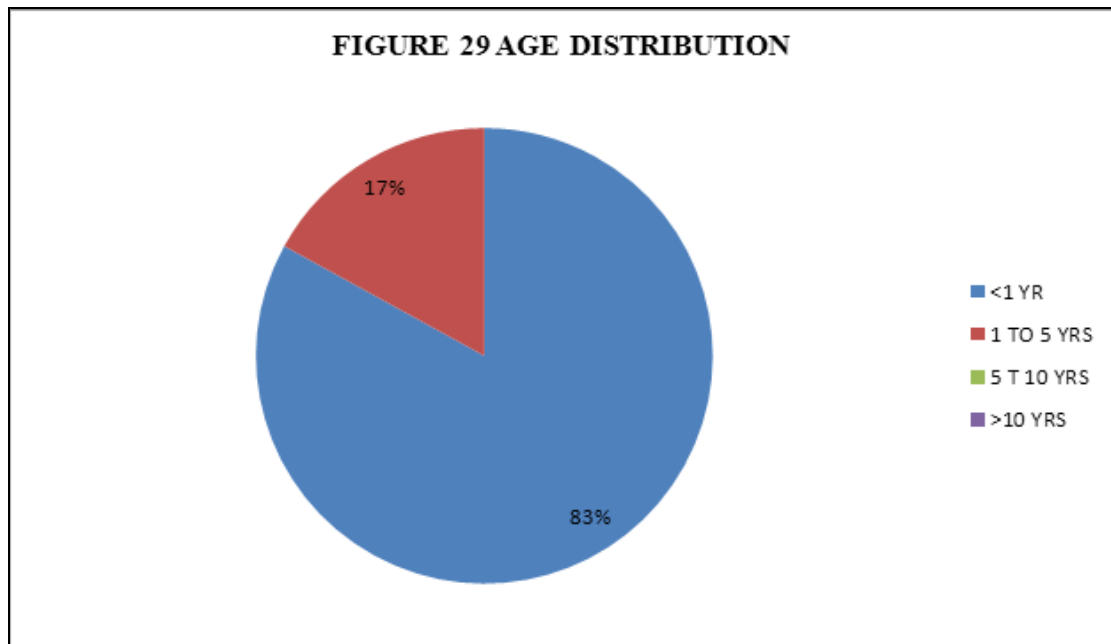


Duration of hospital stay was less than 5 days in 3 cases (33%), 5 to 10 days in 6 cases (67%)

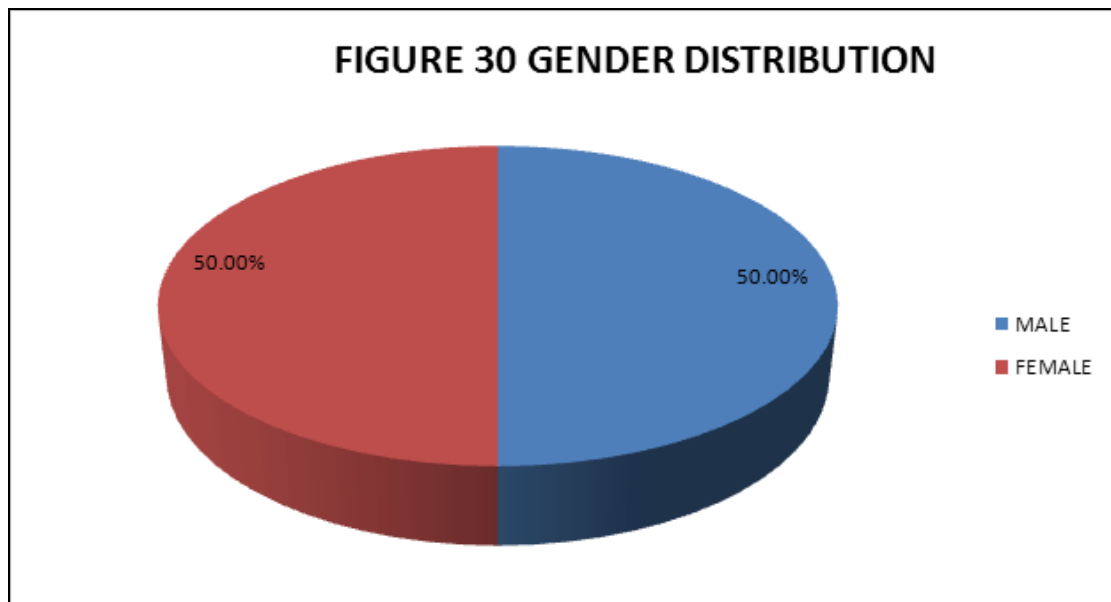


Mortality in cardiogenic shock was 45% (4 cases).

OBSTRUCTIVE SHOCK:



Among 6 cases, age of <1 year constituted 83% (5 cases), age between 1 to 5 years constituted 17% (1 case).



50% (3 cases) of cases were male and 50% (3 cases) were female in the obstructive shock study group.

PRESENTING COMPLAINTS:

All the cases were presented with breathlessness

Table-18: Clinical Assessment In Obstructive Shock

CLINICAL PARAMETERS	FREQUENCY (n=6)	PERCENTAGE
AIRWAY		
STABLE	4	66
UNSTABLE	2	34
RESPIRATORY RATE		
TACHYPNEA	6	100
NORMAL	0	0
ADDED SOUNDS		
NO ADDED SOUNDS	1	16
CREPS	5	84
AIR ENTRY		
NORMAL	1	16
DECREASED	5	84
HEART RATE		
NORMAL	0	0
TACHYCARDIA	6	100
HEART SOUNDS		
NORMAL	0	0
MUFFLED	6	100
MURMUR	0	0
GALLOP	0	0

CLINICAL PARAMETERS	FREQUENCY (n=6)	PERCENTAGE
PULSE VOLUME		
3+/1+	6	100
2+/0	0	0
CAPILLARY REFILLING TIME		
<3 SEC	6	100
>3 SEC	0	0
LIVER SPAN		
NORMAL	6	100
INCREASED	0	0
BLOOD PRESSURE		
NORMAL	0	0
INCREASED	6	100
DECREASED	0	0
AVPU SCALE		
NORMAL	0	0
ALOC	6	100

Table-19: USG Finding In Obstructive Shock

USG PARAMETERS	FREQUENCY (n=6)	PERCENTAGE
PERICARDIAL EFFUSION		
PRESENT	1	16
ABSENT	5	84
LV CONTRACTILITY		
NORMAL	0	0
DECREASED	0	0
INCREASED	6	100
RV CONTRACTILITY		
NORMAL	0	0
RV STRAIN	5	84
DIASTOLIC RV COLLAPSE	1	16
IVC/AORTA RATIO		
NORMAL	6	100
DECREASED	0	0
INCREASED	0	0
IVC COLLAPSABILITY		
>50%	6	100
<50%	0	0
LUNGS		
NORMAL	1	16
PLERUAL EFFUSION	1	16
INTERSTITIAL EDEMA- B PROFILE	0	0
ABSENT SLIDING SIGN	4	68
FREE FLUID ABDOMEN		
PRESENT	0	0
ABSENT	6	100

USG FINDINGS IN OBSTRUCTIVE SHOCK:

HEART:

- ❖ There was pericardial effusion in 1 case.
- ❖ LV contractility were hyperdynamic in all 6 cases (100%),
- ❖ RV strain was present in 5 cases.
- ❖ RV diastolic collapse in 1 case.

IVC /AORTA RATIO:

It was less than 1.5 in all the cases.

IVC COLLAPSIBILITY:

In all cases IVC was collapsible (collapsibility more than 50%).

LUNGS:

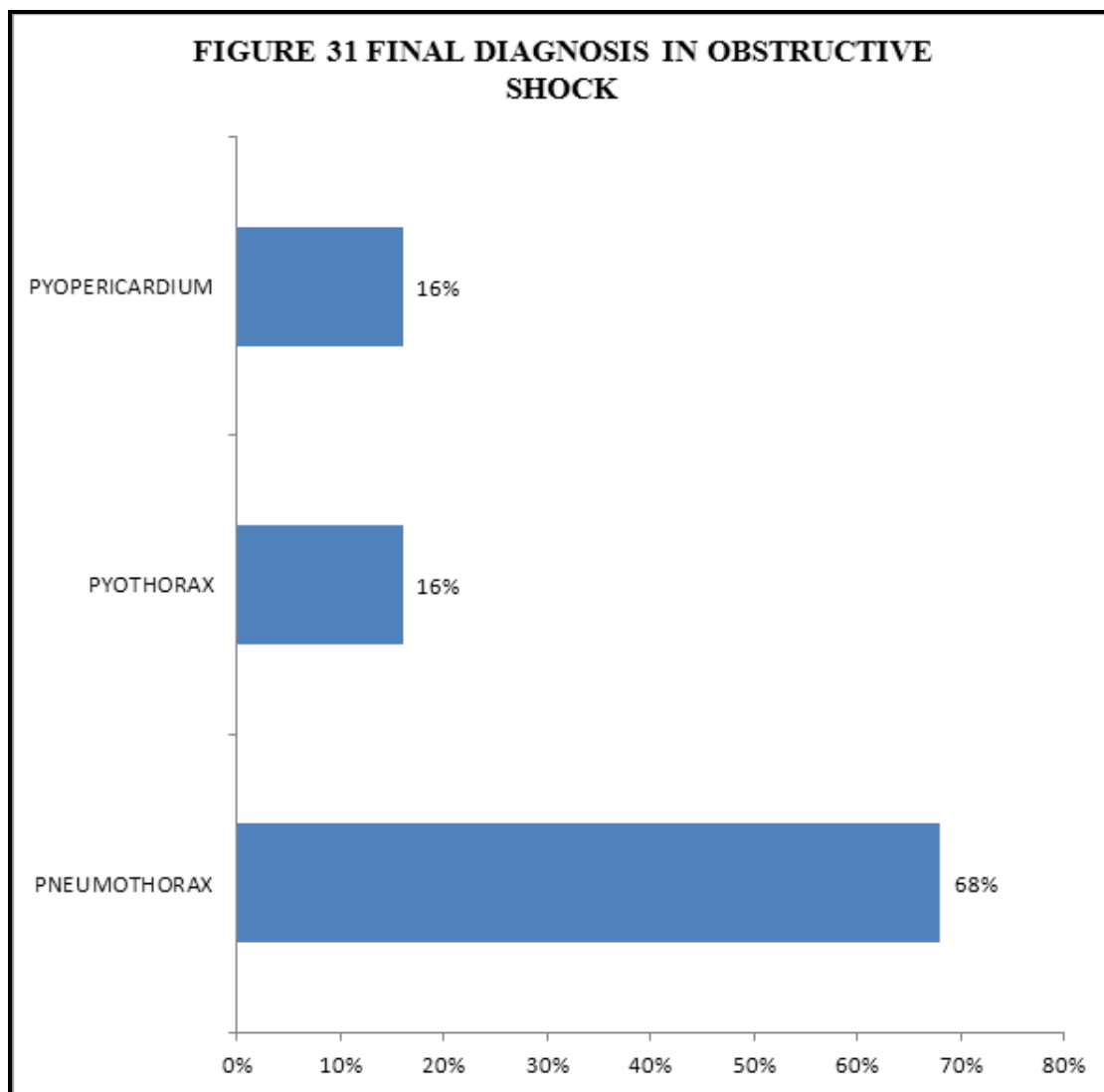
- ❖ 1 case (16%) had normal lung.
- ❖ 1 case (16%) had right sided pleural effusion.
- ❖ 4 cases had pneumothorax(absent sliding sign).

FREE FLUID ABDOMEN:

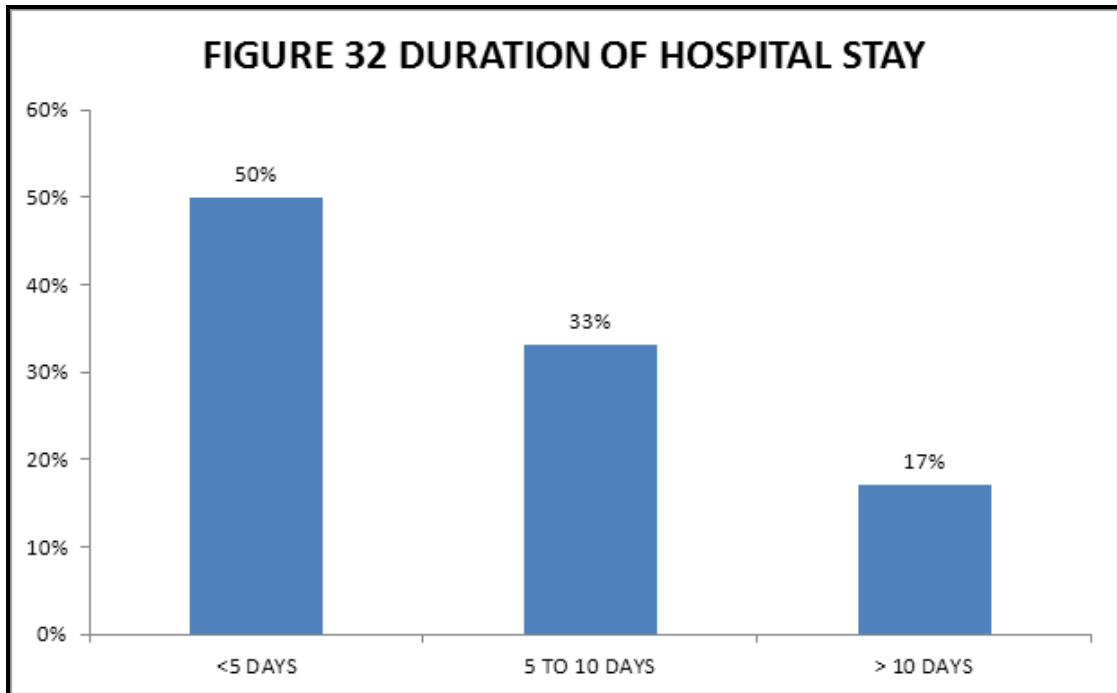
All 6 cases had no free fluid abdomen.

INOTROPES REQUIREMENT:

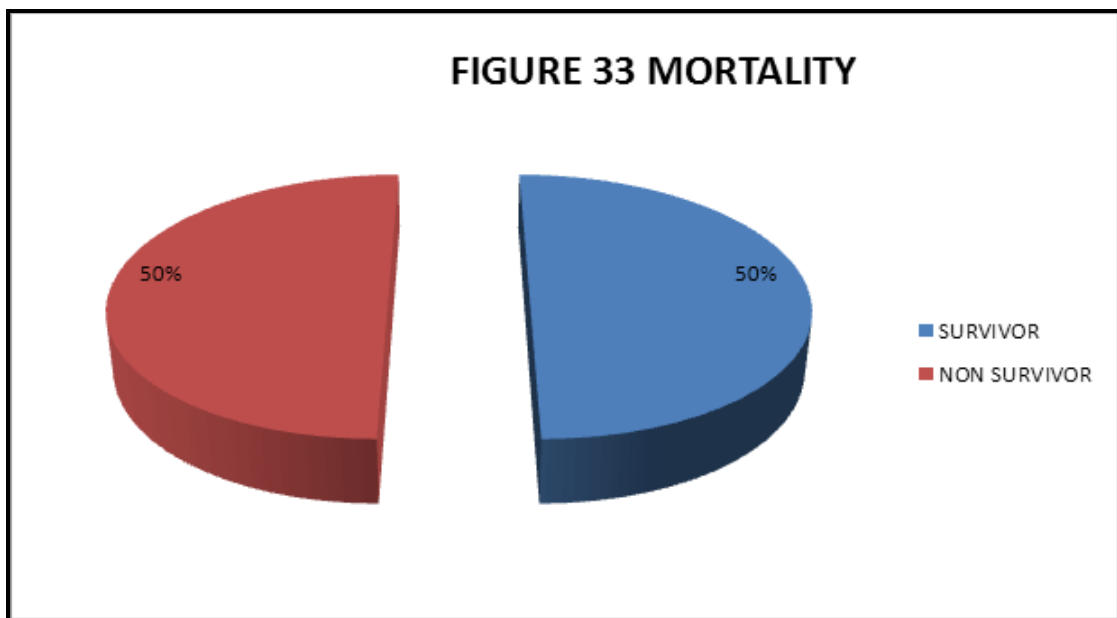
6 cases required inotrope usage.



Among 6 cases final diagnosis was pneumothorax in 68 % (4 cases), pyothorax in 16% (1 case), pyopericardium in 16% (1 case).



Duration of hospital stay was less than 5 days in 3 cases (50%), 5 to 10 days in 2 cases (33%), more than 10 days in 1 case (17%).



Mortality in obstructive shock was 50 % (3cases).

COMPARISON OF CLINICAL SIGNS WITH USG

FINDINGS IN FLUID INTOLERANCE:

Table-20 Agreement Of Heart Gallop With Hypodynamic LV(USG)

HEART SOUND	LV CONTRACTILITY		TOTAL	KAPPA
	INCREASED	DECREASED		
NORMAL	5(100%)	9(47.4%)	14(58.3%)	0.316
GALLOP	0(0%)	10(52.6%)	10(41.7%)	
TOTAL	5(100%)	19(100%)	24(100%)	

Heart sound S3 gallop had fair agreement with decreased LV contractility (hypodynamic LV) in USG in fluid intolerant state with kappa value = 0.316.

Table 21 Agreement Of New Onset Crepitations With Hypodynamic LV (USG)

ADDED SOUNDS	LV CONTRACTILITY		TOTAL	KAPPA
	INCREASED	DECREASED		
NIL	4(80%)	3(15.8%)	7(29.2%)	0.559
CREPTS	1(20%)	16(84.2%)	17(70.8%)	
TOTAL	5(100%)	19(100%)	24(100%)	

New onset crepitations during fluid therapy had moderate agreement with decreased LV contractility(hypodynamic LV) in USG in fluid intolerant state with kappa value = 0.559.

Table-22: Agreement Of Increased Liver Span With Hypodynamic LV (USG)

LIVER SPAN	LV CONTRACTILITY		TOTAL	KAPPA
	INCREASED	DECREASED		
NORMAL	3(60%)	1(5.3%)	4(16.7%)	0.59
INCREASED	2(40%)	18(94.7%)	20(83.3%)	
TOTAL	5(100%)	19(100%)	24(100%)	

Sudden increase in liver span during fluid therapy had almost moderate agreement with decreased LV contractility in fluid intolerant state with kappa value = 0.59.

**Table-23 Agreement Of New Onset Creptations With
B Profile In Lung USG**

ADDED SOUNDS	LUNGS		TOTAL	KAPPA
	NORMAL	INTERSTITIAL EDEMA (B LINES PRESENT)		
NIL	6(66.7%)	1(6.7%)	7(29.2%)	0.627
CREPTS	3(33.3%)	14(93.3%)	17(70.8%)	
TOTAL	9(100%)	15(100%)	24(100%)	

New onset creptations had substantial agreement with pulmonary interstitial odema (B lines in USG) in fluid intolerant state during fluid management with kappa value = 0.627.

**Table-24: Agreement Of Increased Liver Span
With B Profile (Lung USG)**

LIVER SPAN	LUNGS		TOTAL	KAPPA
	NORMAL	INTERSTITIAL EDEMA (B LINES PRESENT)		
NORMAL	4(44.4%)	0(0%)	4(16.7%)	0.5
INCREASED	5(55.6%)	15(100%)	20(83.3%)	
TOTAL	9(100%)	15(100%)	24(100%)	

Sudden increase in Liver span had moderate agreement with pulmonary interstitial edema (B lines in USG) in fluid intolerant state with kappa value = 0.5.

Table 25 Agreement Of Increased Liver Span With IVC/Aorta Ratio – Fullness (USG)

LIVER SPAN	IVC/AORTA		TOTAL	KAPPA
	0.8-1.5 (NORMAL)	>1.5 (IVC FULLNESS)		
NORMAL	3(100%)	1(4.8%)	4(16.7%)	0.833
INCREASED	0(0%)	20(95.2%)	20(83.3%)	
TOTAL	3(100%)	21(100%)	24(100%)	

Increase in Liver span had almost perfect agreement with IVC-Aorta ratio >1.5 (IVC fullness) in fluid intolerant state with kappa value = 0.833.

**Table-26 : Agreement Of Increase In Liver Span
And IVC Non Collapsibility (USG)**

LIVER SPAN	IVC		TOTAL	KAPPA
	IVC COLLAPSIBLE	IVC NON-COLLAPSIBLE		
NORMAL	3(100%)	1(4.8%)	4(16.7%)	0.833
INCREASED	0(0%)	20(95.2%)	20(83.3%)	
TOTAL	3(100%)	21(100%)	24(100%)	

This table shows that the increased liver span had almost perfect agreement with IVC non-collapsibility in fluid intolerant state with kappa value = 0.833.

RESULTS & DISCUSSION

Total number of cases in my study who met the inclusion criteria were 103.

Among 103 cases, 64 cases (62%) were hypovolemic shock, 24 cases (23%) were septic shock, 9 cases (9%) were cardiogenic shock and 6 cases were obstructive shock during the initial assessment. In these 103 cases, 78 cases(76%) had compensated shock and 25 cases(24%) had hypotensive shock. Among 103 cases, 24 cases showed signs of fluid intolerance during shock management. Among them, 5 cases were hypovolemic shock, 10 cases were distributive shock, 9 cases were cardiogenic shock.

Among the 64 hypovolemic shock cases , majority of the affected children came under age the group 1 to 5yrs(48% - 31 cases) . Less than 1 year constituted 22% (14 cases), 5 to 10 yrs constituted 17%(11 cases), more than 10 yrs were 13%(5 cases). Out of them, 57.8% were male and 42.2% were female. The common presenting complaints were loose stools and vomiting(35%), fever with warning signs(31%), fever with breathlessness(14%), polyuria (9%), status epilepticus(5%), bilious vomiting (3%) and bleeding manifestations (3%).

USG findings in hypovolemic shock: 50 cases(78.2%) had hyperdynamic heart. IVC/aorta ratio was decreased (< 0.8) in 58 cases

(91%), IVC collapsibility was more than 50% in all the patients (100%) .64 cases(100%) had normal(A profile) lung and 12 cases had pleural effusion(18%). Free fluid abdomen was absent in 55 cases (86%) and present in 9 cases (14%).

In Tanvi vaidhya et al⁴¹ study on USG evaluation on shock, hyperdynamic heart was 71.8%, A profile in lung was 90%, IVC collapsibility was 100%. Results in this study were comparable to our study.

Harshitha Sridhar et al³⁸ study showed the similar result that positive correlation exists between the hypovolemia and the decreased IVC/Aorta ratio. The value of <0.8 signifies the CVP $<7\text{cm}/\text{H}_2\text{O}$.

Prasert Thanakitcharu et al⁴² study showed the significant correlation between IVC collapsibility index with the central venous pressure. In my study, all the patients with hypovolemic shock had collapsible IVC.

Final diagnosis observed were ADD with dehydration(35%), viral hemorrhagic fever(32%), DKA(9%), respiratory infection(14%). Other causes were acute CNS infection, intestinal obstruction, EHPO, head injury. Mortality in hypovolemic shock was 10%.

In Septic shock, most common age group affected was less than 1 year(46%). Among 24 septic shock children, 66% were male and 34%

were female. The presenting complaint of them were fever with breathlessness (42%), lethargy with refusal of feeds(25%), altered sensorium and status epilepticus 12.5% each, loose stools 8%.

Ultrasound findings in the septic shock: 79.2% had hyperdynamic LV, IVC/Aorta ratio was decreased in 87.5%. Lungs USG showed A profile(100%) and no free fluid in pericardium and abdomen.

Tanvi et al study⁴¹ revealed that in distributive shock 71.8% have normal lv contractility, A profile in 79.5% IVC collapsible in 79.5%.

The initial findings of USG in hypovolemic and septic shock were similar. USG didn't differentiate these two types of shock. M.Iqbal et al⁴⁰ study showed similar result .

The final diagnosis were late onset sepsis (50%), bronchopneumonia (25%), acute CNS infection (25%) and cellulites (5%). The percentage of development of fluid intolerance in septic shock and secondary development of cardiac dysfunction were 41% in my study. Lina De Geer et al⁴³ study described the cardiac dysfunction in sepsis was 50% which was comparable with my study. The mortality was 34% in septic shock.

In cardiogenic shock, the most common age group affected was less than 1year (55%). 55% were male and 45% were female. The most

common presenting complaint were breathlessness(44%) followed by scorpion sting and palpitation.

USG findings in cardiogenic shock : LV contractility was <30%, IVC/Aorta ratio was >1.5 and non collapsible IVC in all patients. Daniel B. Park et al research article suggested the similar findings as the feature of cardiogenic shock

In lungs USG of cardiogenic shock, 67% had B profile suggestive of pulmonary interstitial edema. Tanvi et al study showed hypodynamic heart LV in 100% of Cases and B profile in lungs USG in 81.1% cases. D.Lichtenstein et al¹² research article revealed that the B profile in lung indicates the cardiac compromise and the fluid administration should be limited. Mortality in cardiogenic shock was 45%.

In total of 6 cases of **Obstructive shock**, 4 cases were pneumothorax and it showed RV strain. Cardiac tamponade (1 case) showed pericardial effusion and RV diastolic collapse. One case was pyothorax showing loculated effusion .Mortality was 50%. Tanvi et al⁴¹ study showed that 60% cases had RV strain and 40% cases had cardiac tamponade.

Ultrasound features confirm the diagnosis of cardiogenic shock and obstructive shock. In **Fluid Intolerant State**, the **increased liver span** had almost perfect agreement with IVC non-collapsibility and IVC

fullness (kappa value 0.833). Increased Liver span had fair agreement with the B profile in USG lungs(Interstitial edema, kappa value 0.5) and decreased LV contractility(kappa value 0.59). Rolando Claure-Del Granado et al⁴⁴ study on the fluid overload in ICU patients showed that clinical signs of fluid overload were absent in 18 out of 43 patients(41%). The new onset crepitations had fair agreement with hypodynamic LV (kappa value 0.559) and moderate agreement with B profile (pulmonary edema , kappa value 0.627).

LIMITATION:

Neonates were not included in the study.

CONCLUSION

- ❖ USG findings in my study of 103 shock patients showed the following results
 - **Hypovolemic Shock:** Hyperdynamic LV(78.2%), IVC/AORTA ratio decreased (91%),IVC collapsible(100%), Lungs A profile (100%) .
 - **Septic Shock:** Hyperdynamic LV(79.2%) ,IVC/AORTA ratio decreased(87.5%),IVC Collapsibility(100%) , Lungs USG A profile(100%)
 - **Cardiogenic Shock:** Hypodynamic LV(100%), IVC/ AORTA fullness (100%), IVC non collapsible (100%), Lungs USG B profile (67%).
 - **Obstructive Shock:** Hyperdynamic LV (100%), RV Strain (84%), RV diastolic collapse (16%), pericardial effusion (16%). Lungs USG showed absent sliding sign / bar code sign in M mode (68%), loculated effusion (16%)
- ❖ USG findings in Hypovolemic & septic shock are similar in initial assessment.
- ❖ USG doesn't help in differentiating the hypovolemic & septic shock.

- ❖ In obstructive & cardiogenic shock USG findings confirms the diagnosis.

- ❖ In fluid intolerant states during shock correction sudden increase in liver span had almost perfect agreement with the increased IVC/Aorta ratio (IVC fullness) and IVC non-collapsibility.

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GOVERNMENT STANLEY MEDICAL COLLEGE & HOSPITAL, CHENNAI -01
INSTITUTIONAL ETHICS COMMITTEE

TITLE OF THE WORK : RAPID BEDSIDE ULTRA SONOGRAPHY AND ITS
CORRELATION WITH CLINICAL ASSESSMENT IN MANAGEMENT OF DIFFERENT TYPES
OF SHOCK IN PAEDIATRIC EMERGENCY ROOM.
PRINCIPAL INVESTIGATOR : DR.R.MADHUMATHI
DESIGNATION : PG IN MD PAEDIATRICS
DEPARTMENT : INSTITUTE OF SOCIAL PAEDIATRICS
GOVT. STANLEY MEDICAL COLLEGE.

The request for an approval from the Institutional Ethical Committee (IEC) was considered on the IEC meeting held on 13.04.2018 at the Council Hall, Stanley Medical College, Chennai-1 at 10am.

The members of the Committee, the secretary and the Chairman are pleased to approve the proposed work mentioned above, submitted by the principal investigator.

The Principal investigator and their team are directed to adhere to the guidelines given below:

1. You should inform the IEC in case of changes in study procedure, site investigator investigation or guide or any other changes.
2. You should not deviate from the area of the work for which you applied for ethical clearance.
3. You should inform the IEC immediately, in case of any adverse events or serious adverse reaction.
4. You should abide to the rules and regulation of the institution(s).
5. You should complete the work within the specified period and if any extension of time is required, you should apply for permission again and do the work.
6. You should submit the summary of the work to the ethical committee on completion of the work.


MEMBER SECRETARY,
IEC, SMC, CHENNAI

MEMBER SECRETARY
ETHICAL COMMITTEE,
STANLEY MEDICAL COLLEGE
CHENNAI-600 001.

Urkund Analysis Result

Analysed Document: madhumathi thesis.docx (D57383086)
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CLINICAL PROFORMA

NAME: _____ AGE: _____ WEIGHT: _____ HEIGHT: _____

IP No: _____ SEX: _____ NUTRITIONAL STATUS: _____

ADDRESS: _____

DOA: _____ DOD: _____

PRESENTING COMPLAINTS: _____

PAST HISTORY: _____

Clinical Examination	Initial Assesment	After I bolus (20ml/kg)	After II bolus (20ml/kg)	After III bolus (20ml/kg)		
Airway						
Breathing R R						
Grunting/stridor/retraction						
Abdominal/thoracic						
Air entry added sounds						
Colour						
Circulation:HR Sounds						
Pulse volume						
Warm/cool below thigh/knee/ankle						
CRT						
Liver Span						

BP						
Disability: Alert/verbal/pain/unresponsive						
Pupils						
Eye position – MP/eye deviation nystagmus,lid twitch, DEM/EOM						
Tone and posture						
GTCS/focal seizure						
USG PARAMETERS:						
Pericardial effusion						
LV function						
RV function						
IVC/Aorta ratio						
IVC Collapsability(if non ventilated)						
IVC Distensibility(if ventilated)						
Lung and pleura for free fluid						
Peritoneal cavity for free fluid						
Type of shock						
Cardiac status						
Fluid responsive/Fluid refractory/Fluid overload						
Inotrope initiation						
Other treatments 1.						
2.						
Assisted ventilation						

OUTCOME:

Recovery from the shock.

Mortality due to shock.

Duration of hospital stay.

INFORMATION SHEET

We are conducting a study on **RAPID BEDSIDE ULTRASONOGRAPHY AND ITS CORRELATION WITH CLINICAL ASSESSMENT IN MANAGEMENT OF DIFFERENT TYPES OF PAEDIATRIC SHOCK**” in Paediatric Emergency Department, Institute of Social Paediatrics , Stanley medical college, Chennai and for that your information is valuable to us.

The purpose of this study is to assess the role of Ultrasonogram in Fluid Management of Shock especially in early diagnosis of fluid intolerance and inotrope administration .This inturn reduce the mortality of patients in shock due to fluid overload, morbidity and duration of hospital stay following shock correction.

We are selecting certain cases and if you are found eligible, we may be using your information which in any way does not affect your final report or management.

The privacy of the patients in the research will be maintained throughout the study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.

Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time; your decision will not result in any loss of benefits to which you are otherwise entitled.

The results of the special study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.

Signature of the Participant

Signature of the Investigator

Date:

Place:

ஆராய்ச்சி தகவல் தாள்

குழந்தைகளுக்கு பல்வேறு காரணங்களால் ஏற்படும் இரத்த சுற்றோட்ட சீர்கேட்டை அல்ட்ராசவுண்டு கருவி மூலம் சீர்செய்வது குறித்து ஒர் ஆய்வு

ஆராய்ச்சியாளர்: மரு. இரா.மதுமதி

குழந்தை நலத்துறை,

அரசு ஸ்டான்லி மருத்துவ கல்லூரி

மற்றும் மருத்துவமனை

சென்னை-600 001

நான் குழந்தைகளுக்கு பல்வேறு காரணங்களால் ஏற்படும் இரத்த சுற்றோட்ட சீர்கேட்டை அல்ட்ராசவுண்டு கருவி மூலம் சீர்செய்வது பற்றிய ஆய்வு மேற்கொள்ள உள்ளேன். தாங்கள் இந்த ஆராய்ச்சியில் பங்கேற்க நாங்கள் விரும்புகிறோம்.

ஆய்வில் உள்ள குழந்தைகளின் தனியுரிமை ஆய்வு முழுவதும் பராமரிக்கப்படும். ஆராய்ச்சியின் விளைவாக எந்தவொரு வெளியீடும் அல்லது விளக்கமும் ஏற்பட்டால், தனிப்பட்ட முறையில் அடையாளம் காணப்படும் தகவல் பகிரப்படாது.

இந்த ஆய்வில் தன்னார்வமாக உள்ளவர்கள் பங்கு பெறலாம். இந்த ஆய்வில் பங்கேற்க வேண்டுமா அல்லது எந்த நேரத்திலும் விலகலாமா என்பதைத் தீர்மானிக்க நீங்கள் சுதந்திரமாக இருக்கின்றீர்கள். உங்கள் முடிவால் உங்களுக்கு உரிமை உள்ள எந்த பலன்களையும் இழக்க நேரிடாது.

இந்த ஆய்வின் முடிவுகள் ஆய்வின் முடிவிற்போது தங்களுக்கு தெரிவிக்கப்படும் அல்லது சிகிச்சைக்கு உதவக்கூடிய ஏதேனும் அசாதாரணமானது கண்டுபிடிக்கப்பட்டால் அதுவும் தங்களுக்கு தெரிவிக்கப்படும்.

ஆய்வாளரின் கையொப்பம்

இடம்:

தேதி:

PATIENT CONSENT FORM

STUDY TITLE: “RAPID BEDSIDE ULTRASONOGRAPHY AND ITS CORRELATION WITH CLINICAL ASSESSMENT IN DIFFERENT TYPES OF SHOCK.

STUDY CENTRE: PAEDIATRIC EMERGENCY DEPARTMENT, INSTITUTE OF SOCIAL PAEDIATRICS, STANLEY MEDICAL COLLEGE

PARTICIPANT NAME: AGE: SEX: I.P. NO:

I confirm that I have understood the purpose of interventional procedure for the above study. I have the opportunity to ask the question and all my questions and doubts have been answered to my satisfaction.

I have been explained about the details of the study. I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving any reason.

I understand that the investigator, regulatory authorities and the ethical committee will not need my permission to look at my health records both in respect to the current study and any further research that may be conducted in relation to it, even if I withdraw from the study. I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from the study.

I hereby consent to participate in this study **“RAPID BEDSIDE ULTRASONOGRAPHY AND ITS CORRELATION WITH CLINICAL ASSESSMENT IN DIFFERENT TYPES OF PAEDIATRIC SHOCK”**

Date:

Place:

Guardian's name:

Signature / thumb impression of Guardian

Signature of the Investigator:

	NAME	AGE	GENDER	IP NO	WEIGHT	D O A	COMPLAINTS	PAST HISTORY	TIME_I	AIRWAY_I	RR_I	SCR/ICR_I	AT_T_I	AIR ENTRY_I	ADDED SOUNDS_I	SPO2_I	HR_I	HS_I	PULSE VOLUME_I	TMP_I
1	AKSHIYA	1	2	1883221	7KG	15.6.18	BREATHLESSNESS	NIL	10.30AM	1	3	1	1	1	1	1	2	1	6	1
2	MITHRAN	1	1	1883210	8 KG	23.06.18	BREATHLESSNESS	CP	9:00 PM	1	3	2	1	1	3	2	2	1	6	1
3	B/O VARALAKSHMI	1	1	1883201	4 KG	19.07.18	BREATHLESSNESS	NIL	3.30PM	1	3	2	1	1	1	1	2	1	6	1
4	MITHRAN	1	1	1883987	8 KG	19.08.18	BREATHLESSNESS	CP	1.10 AM	2	4	3	3	1	3	1	2	1	2	2
5	B/O SATHYA	1	1	1884001	4 KG	19.08.18	BREATHLESSNESS	NIL	7.00 PM	2	4	3	3	1	1	1	2	1	2	2
6	ANJAN	4	1	1884321	35KG	29.8.18	ALTERED SENSORIUM	NIL	10.10AM	1	3	1	2	1	1	1	2	1	6	1
7	SHIVANI	1	2	1885121	7 KG	07.09.18	LOOSE STOOLS	NIL	7:00 PM	1	3	1	2	1	1	1	2	1	6	1
8	GANGASHRI	1	2	1885231	3.5KG	25.10.18	LETHARGY/REFUSAL OF FEEDS	BAD CRP	11.AM	2	1	3	3	3	1	2	2	1	3	3
9	AMBETH	1	1	1886453	9KG	1.11.18	STATUS EPILEPTICUS	NIL	9.30AM	1	3	1	1	1	1	1	2	1	6	1
10	RITHISH	2	1	1887321	12KG	15.11.18	STATUS EPILEPTICUS	NIL	12.05AM	1	3	1	1	1	1	1	2	1	6	1
11	MONISHA	1	2	1887654	4 KG	14.12.18	BREATHLESSNESS	NIL	9.20 AM	1	3	1	1	1	1	1	2	1	6	1
12	VISHNUPRIYA	1	2	1887541	4 KG	17.12.18	BREATHLESSNESS	NIL	2.30PM	1	3	1	1	1	1	1	2	1	6	1
13	B/O RAJESHWARI	1	1	1888674	5KG	23.12.18	LETHARGY/REFUSAL OF FEEDS	NIL	2PM	1	3	1	1	1	1	1	2	1	2	2
14	B/O PRIYA	1	2	1887542	5.5KG	1.1.19	LETHARGY/REFUSAL OF FEEDS	NIL	11.15AM	1	3	1	1	1	1	1	2	1	6	1
15	DHARSHITH	1	1	1887796	8KG	12.1.19	BREATHLESSNESS/FEVER	NIL	7:00 AM	1	3	2	1	1	3	2	2	1	6	1
16	JOSFEN	1	1	1887401	6 KG	17.12.18	LETHARGY/REFUSAL OF FEEDS	NIL	11.AM	2	1	3	3	3	1	2	2	1	3	3
17	MOHAMMAD YUSUF	1	1	1888415	6 KG	2.2.19	BREATHLESSNESS/FEVER	NIL	9:00 PM	1	3	2	1	1	3	2	2	1	6	1
18	ROOPESH	1	1	1884072	4 KG	3.12.18	BREATHLESSNESS/FEVER	NIL	7:00 AM	1	3	2	1	1	3	2	2	1	6	1
19	AAKASH	2	1	1927458	10 KG	9.5.19	BREATHLESSNESS	CP	10.30AM	1	3	1	1	1	1	1	2	1	6	1
20	SARA	2	2	1902052	17 KG	16.3.19	ALTERED SENSORIUM	NIL	10.10AM	1	3	1	1	1	1	1	2	1	6	1
21	RITHIKA	1	2	1928961	9KG	9.5.19	STATUS EPILEPTICUS	NIL	9.30AM	2	4	3	3	3	1	2	2	1	6	1
22	JOE	4	1	1905066	27 KG	26.1.19	ALTERED SENSORIUM/LOOSE STOOLS	NIL	11.AM	1	1	3	3	3	1	2	2	1	3	3
23	B/O LAKSHMI	1	1	1905122	4 KG	20.2.19	LETHARGY/REFUSAL OF FEEDS	NIL	2PM	1	3	1	1	1	1	1	2	1	2	2
24	RANJAN	1	1		3.5KG	23.3.19	LETHARGY/REFUSAL OF FEEDS	BAD CRP	11.AM	2	4	3	3	3	1	1	2	1	3	3

CRT_I	LS_I	BP_I	PP_I	AVPU_I	PUPILS_I	DEM_I	TONE_I	CSE_I	SHOCK TYPE_CI	FLUID STATUS_CI	CC-RV	CC-LV	PE_I	IVC/ AORTA_I	COLLAP SIBILITY_I	LUNG_I	FFA_I	DIAGNOSIS	DURATION OF HOSPITAL STAY	SURVIVAL NON SURVIVAL
3	1	2	3	2	1	1	2	1	2AC	1	1	1	1	1	1	1	1	BRONCHOPNEUMONIA	2	1
3	1	1	3	2	1	1	2	1	2AC	1	1	3	1	2	1	1	1	BRONCHOPNEUMONIA	2	1
3	1	1	3	2	1	1	2	1	2AC	1	1	3	1	2	1	1	1	LATE ONSET SEPSIS	3	1
2	1	1	1	4	1	2	2	1	2BC	1	1	3	1	2	1A	1	1	BRONCHOPNEUMONIA/REFRACTORY SEPTIC SHOCK	2	2
2	1	1	1	4	1	2	2	1	2BC	1	1	3	1	2	1A	1	1	LATE ONSET SEPSIS/REFRACTORY SEPTIC SHOCK	1	2
3	1	1	3	2	1	1	2	1	2AC	1	1	3	1	2	1	1	1	VARICELLA ENCEPHALITIS	3	1
3	1	2	3	2	1	1	1	1	2AC	1	1	1	1	2	1	1	1	LATE ONSET SEPSIS	3	1
2	1	3	2	4	1	1	2	1	2BD	1	1	3	1	2	1	1	1	LATE ONSET SEPSIS	1	2
3	1	1	3	4	2	2	2	1	2AC	1	1	3	1	2	1	1	1	ACUTE CNS INFECTION	3	1
3	1	2	3	4	1	2	2	2	2AC	1	1	3	1	2	1	1	1	ACUTE CNS INFECTION	3	1
3	1	1	3	2	1	1	2	1	2AC	1	1	3	1	2	1	1	1	LATE ONSET SEPSIS	3	1
3	1	2	3	2	1	1	2	1	2AC	1	1	1	1	1	1	1	1	LATE ONSET SEPSIS	3	1
2	1	2	2	2	1	1	1	1	2BC	1	1	3	1	2	1	1	1	LATE ONSET SEPSIS	3	1
3	1	2	3	2	1	1	2	1	2AC	1	1	3	1	2	1	1	1	LATE ONSET SEPSIS	3	1
3	1	2	3	2	1	1	1	1	2AC	1	1	3	1	2	1	1	1	BRONCHOPNEUMONIA/REFRACTORY SEPTIC SHOCK	1	2
2	1	3	2	4	1	1	2	1	2BD	1	1	3	1	2	1	1	1	LATE ONSET SEPSIS/REFRACTORY SEPTIC SHOCK	1	2
3	1	1	3	2	1	1	2	1	2AC	1	1	3	1	2	1	1	1	BRONCHOPNEUMONIA	2	1
3	1	2	3	2	1	1	1	1	2AC	1	1	3	1	2	1	1	1	LATE ONSET SEPSIS/REFRACTORY SEPTIC SHOCK/AKI	1	2
3	1	1	3	2	1	1	2	1	2AC	1	1	1	1	1	1	1	1	ASPIRATION PNEUMONIA/SEPTIC SHOCK	2	1
3	1	1	3	2	1	1	2	1	2AC	1	1	3	1	2	1	1	1	ACUTE CNS INFECTION/SEPTIC SHOCK	3	1
3	1	2	3	4	2	2	2	2	2AC	1	1	3	1	2	1	1	1	ACUTE CNS INFECTION/SEPTIC SHOCK	3	1
2	1	3	2	4	1	1	2	1	2BD	1	1	3	1	2	1	1	1	ACUTE ENCEPHALITIS/REFRACTORY SEPTIC SHOCK	1	2
2	1	2	2	2	1	1	1	1	2BC	1	1	1	1	2	1	1	1	LATE ONSET SEPSIS	3	1
2	1	3	2	4	1	1	2	1	2BD	1	1	3	1	2	1	1	1	LATE ONSET SEPSIS	1	2

S_NO	NAME	AGE	GENDER	IP NO	WEIGHT	D O A	COMPLAINTS	PAST HISTORY	TIME_I	AIRWAY_I	RR_I	SCR/ICR_I	AT_T_I	AIR ENTRY_I	ADDED SOUNDS_I	SPO2_I	HR_I	HS_I	PULSE VOLUME_I	TMP_I
1	DHASHWANATH	2	1	1854371	10 KG	26.06.18	STATUS EPILEPTICUS	HYDROCEP HALIUS	12.20 PM	2	4	3	3	1	1	1	2	1	3	3
2	KEERTHI	1	2	1854506	8 KG	10.07.18	HEAD INJURY	NIL	11:00 AM	1	3	1	1	1	1	1	2	1	2	2
3	NAVEENKUMAR	2	1	1854789	13 KG	16.07.18	UNKNOWN BITE	NIL	11:00 AM	2	4	3	3	1	1	1	2	1	2	2
4	MITHRAN	2	1	1855429	11 KG	11.07.18	FEBRILE STATUS EPILEPTICUS	NIL	10.10 PM	2	4	3	3	1	1	1	2	1	2	2
5	RAGHAVI	2	2	1855432	14 KG	27.07.18	ADD	NIL	2.30 PM	1	3	1	1	1	1	1	2	1	2	2
6	DEVADHARSHINI	2	2	1856234	13 KG	27.07.18	BILIOUS VOMITTING	NIL	9.10 PM	1	3	1	1	1	1	1	2	1	3	3
7	JEEVAN SAI	2	1	1857231	10 KG	24.08.18	ADD	NIL	2.10 PM	1	3	1	1	1	1	1	2	1	3	3
8	MITHRAN	1	1	1856534	7 KG	11.07.18	BREATHLESSNESS/FEVER	NIL	6.15 PM	1	3	2	1	1	3	2	2	1	2	2
9	DHANUSREE	2	2	1856421	9 KG	31.08.18	FEVER/BREATHLESSNESS	NIL	6.30 AM	1	3	2	1	1	3	1	2	1	2	2
10	TAMILARASAN	1	1	1857001	4.5KG	27.8.18	BREATHLESSNESS/FEVER	NIL	7.50PM	1	3	2	1	1	3	2	2	1	2	2
11	MITHRAN	1	1	1857291	7 KG	11.07.18	BREATHLESSNESS/FEVER	NIL	6.15 PM	1	3	2	1	1	3	2	2	1	2	2
12	B/O ADHILAKSHMI	1	1	1858874	4.5 KG	03.09.18	LOOSE STOOLS	NIL	8:00 PM	1	3	2	1	1	3	1	2	1	2	2
13	FARHANA FATHIMA	1	2	1858888	6KG	01.09.18	HEMETEMESIS	NIL	10:00 PM	1	3	1	1	1	1	1	2	1	2	3
14	SASIKALA	4	2	1860577	35 KG	07.09.18	DRUG POISONING	NIL	3:00 PM	2	4	3	3	3	1	2	2	1	2	2
15	MITHRAN	1	1	1859988	6 KG	05.09.18	BREATHLESSNESS/FEVER	NIL	7:00 PM	2	4	3	3	1	1	1	2	1	2	2
16	SANDHYASRI	2	2	1862463	14 KG	16.09.18	FEVER/STATUS EPILEPTICUS	CP	9.00PM	2	4	3	3	3	1	3	2	1	2	2
17	HARIHARAN	4	1	1864261	30KG	4.10.18	RICE WATER STOOLS	NIL	5.10PM	1	3	1	2	1	1	1	2	1	3	3
18	KASHIKA	2	2	1867710	12KG	10.10.18	MEDULLOBLASTOMA/POSTSURGERY	NIL	1.30PM	2	4	3	3	1	1	1	2	1	3	3
19	ASIYA AFRIN	2	2	1888532	15KG	2.10.18	FEVER/STATUS EPILEPTICUS	CP	7.20PM	2	4	3	3	3	1	2	2	1	2	2
20	THIRUVENGADAM	2	1	1866204	24KG	5.10.18	HEAD INJURY	NIL	3.20PM	1	3	1	1	1	1	1	2	1	2	2
21	SARAVANAN	1	1	1861851	6KG	18.09.18	FEVER/BREATHLESSNESS	NIL	7.00PM	1	3	2	1	1	3	2	2	1	2	2
22	ABUHUSSAIN	2	1	1868861	16KG	26.09.18	FEVER/STATUS EPILEPTICUS	CP	2.00PM	2	4	3	3	3	1	1	2	1	2	2
23	NITHYA	1	2	1867456	6KG	01.09.18	HEMETEMESIS	NIL	10:00 PM	1	3	1	1	1	1	1	2	1	2	3
24	FASSIL	1	1	1868920	7KG	15.10.18	LOOSE STOOLS/VOMITTING	CP	9.15AM	1	3	1	1	1	1	1	2	1	2	2
25	HARIPRASAD	4	1	1878912	30KG	20.10.18	RICE WATER STOOLS	NIL	5.10PM	1	3	1	2	1	1	1	2	1	3	3
26	MOHAMMED ABDUL	2	1	1889011	14KG	22.10.18	RICE WATER STOOLS	NIL	8.00AM	1	3	1	1	1	1	1	2	1	3	3
27	JAVID	1	1	1875140	8KG	1.11.18	LOOSE STOOLS	NIL	1.30PM	1	3	1	1	1	1	1	2	1	2	2
28	ALINA	2	2	1875192	10KG	1.11.18	LOOSE STOOLS	NIL	8.50PM	1	3	1	1	1	1	1	2	1	2	2
29	PRIYANKA	4	2	1879893	35KG	16.11.18	LOOSE STOOLS	NIL	1.00AM	1	3	1	2	1	1	1	2	1	3	3
30	MOHAMMED ROSHAN	1	1	1885019	10 KG	15.12.18	ADD	NIL	2.30 PM	1	3	1	1	1	1	1	2	1	2	2
31	INIYAVAN	2	1	1876001	11 KG	17.12.18	LOOSE STOOLS	NIL	8.50PM	1	3	1	1	1	1	1	2	1	2	2
32	MOKSHA	1	2	1876321	10KG	20.12.18	LOOSE STOOLS	NIL	6.50 PM	1	3	1	1	1	1	1	2	1	2	2
33	SRIVATSA	1	1	1886232	7KG	14.1.19	LOOSE STOOLS/VOMITTING	NIL	9.15AM	1	3	1	1	1	1	1	2	1	2	2
34	DIVYA	2	2	1887319	13 KG	27.1.19	BILIOUS VOMITTING	NIL	9.10 PM	1	3	1	1	1	1	1	2	1	3	3

CRT_I	LS_I	BP_I	PP_I	AVPU_I	PUPILS_I	DEM_I	TONE_I	CSE_I	SHOCK TYPE_CI	FLUID STATUS_CI	CC-RV	CC-LV	PE_I	IVC/ AORTA_I	COLLAP SIBILITY_I	LUNG_I	FFA_I	DIAGNOSIS	DURATION OF HOSPITAL STAY	SURVIVAL NON SURVIVAL
2	1	3	2	4	2	2	2	2	1D	1	1	3	1	2	1	1	1	POST HEMORRHAGIC HYDROCEPHALUS	1	2
2	1	1	1	2	1	1	2	1	1C	1	1	1	1	1	1	1	1	HEAD INJURY	2	1
2	2	2	2	4	1	2	2	1	1C	1	1	3	1	2	1	1	1	UNKNOWN BITE	2	1
2	1	1	1	4	1	2	2	2	1C	1	1	1	1	1	1	1	1	ACUTE CNS INFECTION	3	1
2	1	1	1	2	1	1	1	1	1C	1	1	3	1	2	1	1	1	ADD WITH SEVERE DEHYDRATION	1	1
2	1	3	2	3	1	1	2	1	1D	1	1	3	1	2	1	1	1	INTESTINAL OBSTRUCTION	1	1
2	1	3	2	3	1	1	2	1	1D	1	1	3	1	2	1	1	1	ADD WITH SEVERE DEHYDRATION	1	1
2	1	1	1	2	1	1	1	1	1C	1	1	3	1	2	1	1	1	WALRI	1	1
2	1	1	1	2	1	1	1	1	1C	1	1	3	1	2	1	1	1	BRONCHOPNEUMONIA	2	1
2	1	1	2	2	1	1	2	1	1C	1	1	3	1	2	1	1	1	BRONCHOPNEUMONIA	2	1
2	1	1	1	2	1	1	1	1	1C	1	1	1	1	1	1	1	1	WALRI	1	1
2	1	2	2	2	1	1	2	1	1C	1	1	3	1	2	1	1	1	LATE ONSET SEPSIS	1	2
2	2	2	1	2	1	1	2	1	1C	1	1	3	1	2	1	1	1	EHPO/ GI BLEED	1	2
2	1	2	1	2	1	2	2	1	1C	1	1	1	1	2	1	1	1	ACCIDENTAL CPM INGESTION	1	1
2	1	1	1	2	1	1	1	1	1C	1	1	3	1	2	1	1	1	BRONCHIOLITIS	2	1
2	1	2	1	3	1	2	2	2	1C	1	1	3	1	2	1	1	1	FEVER PROVOKED SEIURES/CEREBRAL PALSY	1	1
2	1	3	2	2	1	1	1	1	1D	1	1	3	1	2	1	1	1	ADD WITH SEVERE DEHYDRATION	1	1
2	1	3	2	4	1	2	2	1	1D	1	1	3	1	2	1	1	1	MEDULLOBLASTOMA OPERATED	2	1
2	1	2	1	4	1	2	2	2	1C	1	1	3	1	2	1	1	1	ACUTE CNS INFECTION	1	1
2	1	2	1	2	1	1	1	1	1C	1	1	3	1	2	1	1	1	HEAD INJURY	1	1
2	1	2	1	2	1	1	1	1	1C	1	1	3	1	2	1	1	1	BRONCHOPNEUMONIA	2	1
2	1	2	1	4	1	2	2	1	1C	1	1	1	1	1	1	1	1	CP/SEIURE DISORDER/AKI/METABOLICENCEPHALPATHY	2	2
2	2	2	1	2	1	1	2	1	1C	1	1	3	1	2	1	1	1	EHPO/ GI BLEED	1	1
2	1	2	2	2	1	1	2	1	1C	1	1	1	1	1	1	1	1	ACUTE GASTROENTERITIS	1	1
2	1	3	2	2	1	1	1	1	1D	1	1	3	1	2	1	1	1	ADD WITH SEVERE DEHYDRATION	1	1
2	1	3	2	2	1	1	2	1	1D	1	1	3	1	2	1	1	1	ADD WITH SEVERE DEHYDRATION	1	1
2	1	1	2	2	1	1	1	1	1C	1	1	3	1	2	1	1	1	ADD WITH SEVERE DEHYDRATION	1	1
2	1	1	2	2	1	1	1	1	1C	1	1	1	1	1	1	1	1	ADD WITH SEVERE DEHYDRATION	1	1
2	1	3	2	2	1	1	1	1	1D	1	1	3	1	2	1	1	1	ADD WITH SEVERE DEHYDRATION	1	1
2	1	1	1	2	1	1	1	1	1C	1	1	3	1	2	1	1	1	ADD WITH SEVERE DEHYDRATION	1	1
2	1	1	2	2	1	1	1	1	1C	1	1	3	1	2	1	1	1	ADD WITH SEVERE DEHYDRATION	1	1
2	1	1	2	2	1	1	1	1	1C	1	1	3	1	2	1	1	1	ADD WITH SEVERE DEHYDRATION	1	1
2	1	2	2	2	1	1	2	1	1C	1	1	3	1	2	1	1	1	ACUTE GASTROENTERITIS	1	1
2	1	3	2	3	1	1	2	1	1D	1	1	3	1	2	1	1	1	INTESTINAL OBSTRUCTION	1	1

S_NO	NAME	AGE	GENDER	IP NO	WEIGHT	NUTRIONAL STATUS	D O A	COMPLAINTS	PAST HISTORY	TIME_I	AIRWAY_I	RR_I	SCR/ICR_I	AT_T_I	AIR ENTRY_I	ADDED SOUNDS_I	SPO2_I	HR_I	HS_I	PULSE VOLUME_I
1	PUGHALENDHI	3	1	1866373	36KG	N	6.10.18	FEVER/WARNING SIGNS	NIL	4.30PM	1	3	1	2	1	1	1	2	1	2
2	SAKTHI	2	2	1888956	20KG	N	20.10.18	FEVER/WARNING SIGNS	NIL	3.00PM	1	3	1	2	2A	1	1	1	1	2
3	ASWINKUMAR	3	1	1889720	25KG	N	21.10.18	FEVER/WARNING SIGNS	NIL	11.25AM	1	3	1	1	2A	1	1	2	1	2
4	VARSHINI	3	2	1890460	24KG	N	22.10.18	FEVER/WARNING SIGNS	NIL	4.45PM	1	3	1	2	2A	1	1	2	1	2
5	SUBHASHINI	3	2	1873826	22KG	N	29.10.18	FEVER/WARNING SIGNS	NIL	6.00PM	1	3	1	2	1	1	1	1	1	2
6	SARANYA	2	2	1873758	20KG	N	29.10.18	FEVER/WARNING SIGNS	NIL	7.00PM	1	3	1	1	1	1	1	2	1	2
7	UMAR ALI	2	1	1875377	13KG	N	2.11.18	FEVER /WARNING SIGNS	NIL	11.10PM	1	3	1	1	1	1	1	2	1	2
8	PREETHIKA	2	2	1876334	16KG	N	5.11.18	FEVER/WARNING SIGNS	NIL	2.00PM	1	3	1	1	2A	1	1	1	1	2
9	SHAKSHEE	2	1	1876753	16KG	N	6.11.18	FEVER/WARNING SIGNS	NIL	4.00PM	1	3	1	1	2A	1	1	2	1	3
10	NICOLAS	2	1	1877220	9KG	N	10.11.18	FEVER/WARNING SIGNS	NIL	12.05PM	1	1	1	1	1	1	1	1	1	2
11	RISWAN	2	1	1878486	14KG	N	11.11.18	FEVAR/WARNING SIGNS	NIL	3.20PM	1	3	1	1	2A	1	1	2	1	2
12	LUBANA	3	2	1889616	22KG	N	13.11.18	FEVER/WARNING SIGNS	NIL	1.15PM	1	3	1	2	2A	1	1	2	1	3
13	AMREEN	2	2	1880355	13KG	N	17.11.18	FEVER/WARNING SIGNS	NIL	11.30PM	1	3	1	1	2A	1	1	2	1	3
14	DHIVYADHARSHINI	3	2	1889991	37KG	N	23.11.18	FEVER/WARNING SIGNS	NIL	10.00AM	1	1	1	2	1	1	1	1	1	2
15	SAIDHIVYA	2	2	1882257	14KG	N	26.11.18	FEVER/WARNING SIGNS	NIL	1.00PM	1	3	1	1	1	1	1	2	1	3
16	SANTHOSH	2	1	1882641	11 KG	N	27.11.18	FEVER/WARNING SIGNS	NIL	7:00 PM	1	3	1	1	1	1	1	2	1	2
17	MOSINA THABASUM	3	2	1886467	20 KG	N	31.11.18	FEVER/WARNING SIGNS	NIL	4.30PM	1	3	1	2	1	1	1	2	1	2
18	DEEPAK	3	1	1905613	30 KG	N	30.5.19	FEVER/WARNING SIGNS	NIL	9:00 PM	1	3	1	1	1	1	1	2	1	2
19	JEEVADESH	3	1	1905623	29 KG	N	30.5.19	FEVER/WARNING SIGNS	NIL	10.30 PM	1	1	1	2	1	1	1	1	1	2
20	JITHAN	2	1	1903409	16KG	N	6.3.19	FEVER/WARNING SIGNS	NIL	4.00PM	1	3	1	1	2A	1	1	2	1	3
21	SRI	2	2	1904711	12 KG	N	26.4.19	FEVER/WARNING SIGNS	NIL	1.00PM	1	3	1	1	1	1	1	2	1	3
22	MAYURI	2	2	1904899	20KG	N	30.4.19	FEVER/WARNING SIGNS	NIL	7.00PM	1	3	1	1	1	1	1	2	1	2
23	VETRIVEL	3	1	1925766	24 KG	N	12.5.19	FEVER/WARNING SIGNS	NIL	4.30PM	1	3	1	2	1	1	1	1	1	2
24	AKASH	4	1	186549	35KG	N	26.09.18	FEVER/WARNING SIGNS	NIL	5.30AM	1	3	1	2	1	1	1	2	1	3

TMP_I	CRT_I	LS_I	BP_I	PP_I	AVPU_I	PUPILS_I	DEM_I	TONE_I	CSE_I	SHOCK TYPE_CI	FLUID STATUS_CI	CC-RV	CC-LV	PE_I	IVC/AORTA_I	COLLAP SIBILITY_I	LUNG_I	FFA_I	DIAGNOSIS	DURATION OF HOSPITAL STAY	SURVIVAL NON SURVIVAL
2	2	1	2	2	2	1	1	1	1	5C	1	1	3	1	2	1	1	1	VIRAL HEMORRHAGIC FEVER	2	1
2	2	1	1	2	2	1	1	1	1	5C	1	1	1	1	2	1	2	2	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	1	2	2	1	1	1	1	5C	1	1	3	1	2	1	2	2	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	1	2	2	1	1	1	1	5C	1	1	3	1	2	1	2	2	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	1	2	1	1	1	1	1	5C	1	1	1	1	2	1	1	1	DENGUE HEMORRHAGIC SHOCK	1	1
2	2	1	1	2	1	1	1	1	1	5C	1	1	3	1	2	1	1	1	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	1	2	2	1	1	1	1	5C	1	1	3	1	2	1	1	1	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	1	2	1	1	1	1	1	5C	1	1	1	1	2	1	2	2	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	3	2	2	1	1	1	1	5D	1	1	3	1	2	1	2	2	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	1	2	1	1	1	1	1	5C	1	1	1	1	2	1	1	1	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	1	2	1	1	1	1	1	5C	1	1	3	1	2	1	2	2	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	3	2	2	1	1	1	1	5D	1	1	3	1	2	1	2	2	DENGUE HEMORRHAGIC SHOCK	2	1
3	2	1	3	2	2	1	1	1	1	5D	1	1	3	1	2	1	2	2	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	1	2	1	1	1	1	1	5C	1	1	1	1	2	1	1	1	DENGUE HEMORRHAGIC SHOCK	2	1
3	2	1	3	2	2	1	1	1	1	5D	1	1	3	1	2	1	1	1	DENGUE HEMORRHAGIC SHOCK	2	1
2	1	2	1	2	1	1	1	1	1	5C	1	1	3	1	2	1	1	1	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	1	2	1	1	1	1	1	5C	1	1	1	1	2	1	2	1	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	3	2	2	1	1	1	1	5D	1	1	3	1	2	1	2	2	DENGUE HEMORRHAGIC SHOCK	2	1
3	2	1	3	2	2	1	1	1	1	5D	1	1	3	1	2	1	2	1	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	1	2	1	1	1	1	1	5C	1	1	3	1	2	1	1	1	DENGUE HEMORRHAGIC SHOCK	2	1
2	2	1	2	2	2	1	1	1	1	5C	1	1	1	1	2	1	1	1	VIRAL HEMORRHAGIC FEVER	2	1
3	2	2	3	2	1	1	1	1	1	5D	1	1	3	1	2	1	2	1	VIRAL HEMORRHAGIC FEVER	2	1

S_NO	NAME	AGE	GENDER	IP NO	WEIGHT	NUTRIONAL STATUS	D O A	COMPLAINTS	PAST HISTORY	TIME_I	AIRWAY_I	RR_I	SCR/ICR_I	AT_T_I	AIR ENTRY_I	ADDED SOUNDS_I	SPO2_I	HR_I	HS_I	PULSE VOLUME_I	TMP_I	CRT_I	LS_I	BP_I	PP_I
1	YUKESHWARAN	4	1	1886200	35 KG	N	16.07.18	palpitation	NIL	8:00 AM	1	3	2	2	1	1	1	2	4	3	3	3	2	3	2
2	NAVEENKUMAR	2	1	1886228	10KG	N	16.07.18	UNKNOWN BITE	NIL	11.00AM	1	3	2	1	1	3	1	2	4	2	2	2	2	2	2
3	SAVIYASRI	2	2	1884837	11KG	N	11.9.18	SCORPION STING	NIL	8.00PM	1	3	2	1	1	1	1	2	1	3	3	3	2	3	2
4	ASHVIN	2	1	1931683	15KG	N	21.5.19	SCORPION STING	NIL	2.20 PM	1	3	2	1	1	1	1	2	1	2	2	2	2	2	2
5	NITHISH	2	1	1932742	9KG	N	24.5.19	BREATHLESSNESS	NIL	10.45AM	1	3	2	1	1	3	1	2	4	3	3	3	2	3	2
6	NANCY	1	2	1885721	4KG	N	2.2.19	BREATHLESSNESS	NIL	6.30PM	1	3	2	1	1	3	1	2	3	2	2	2	2	2	2
7	SADANA	2	2	1927389	9KG	N	15.5.19	BREATHLESSNESS	NIL	5.30PM	1	3	2	1	1	3	1	2	3	2	2	2	2	2	2
8	PAVITHRA	2	2	1887341	11KG	N	20.3.19	SCORPION STING	NIL	8.30 PM	1	3	2	1	1	1	1	2	1	3	3	3	2	3	2
9	RAJESH	1	1	1930741	7 KG	N	24.4.19	BREATHLESSNESS	NIL	9.45 PM	1	3	2	1	1	3	1	2	4	3	3	3	2	3	2

AVPU_I	PUPILS_I	DEM_I	TONE_I	CSE_I	SHOCK TYPE_CI	FLUID STATUS_CI	CC-RV	CC-LV	PE_I	IVC/ AORTA_I	COLLAP SIBILITY_I	LUNG_I	FFA_I	DIAGNOSIS	DURATION OF HOSPITAL STAY	SURVIVAL NON SURVIVAL
1	1	1	1	1	3D	2	1	2	1	3	2	1	1	VENTRICULAR TACHYARRHYTHMIA	2	1
2	1	1	1	1	3C	2	1	2	1	3	2	3	1	SCORPION STING WITH ENVENOMATION	2	1
2	1	1	1	1	3D	2	1	2	1	3	2	1	1	SCORPION STING WITH ENVENOMATION	1	2
1	1	1	1	1	3C	2	1	2	1	3	2	3	1	SCORPION STING WITH ENVENOMATION	2	1
3	1	2	2	1	3D	2	1	2	1	3	2	3	1	VIRAL MYOCARDITIS	1	2
2	1	1	1	1	3C	2	1	2	1	3	2	3	1	VSD/CCF	2	1
2	1	1	1	1	3C	2	1	2	1	3	2	1	1	CHD/CCF	2	1
2	1	1	1	1	3D	2	1	2	1	3	2	3	1	SCORPION STING WITH ENVENOMATION	1	2
3	1	2	2	1	3D	2	1	2	1	3	2	3	1	VIRAL MYOCARDITIS	1	2

S_NO	NAME	AGE	GENDER	IP NO	WEIGHT	NUTRIONAL STATUS	D O A	COMPLAINTS	PAST HISTORY	TIME_I	AIRWAY_I	RR_I	SCR/ICR_I	AT_T_I	AIR ENTRY_I	ADDED SOUNDS_I	SPO2_I	HR_I	HS_I	PULSE VOLUME_I	TMP_I
1	B/O PREETHA	1	1	1937683	3.7KG	N	27.5.19	BREATHLESSNESS	MOTHER PLH	3.30PM	2	4	3	3	2A	3	3	2	2	2	2
2	ANJANASRI	2	2	1900764	9 KG	N	22.3.19	BREATHLESSNESS	NIL	2.20PM	2	4	3	3	2A	3	3	2	2	2	2
3	THARIKA	1	2	1889732	5 KG	N	20.2.19	BREATHLESSNESS/FEVER	NIL	9.30AM	1	3	2	1	2A	3	2	2	2	2	2
4	ROOPESH	1	1	1876543	5 KG	N	1.12.18	FEVER/BREATHLESSNESS	NIL	8AM	1	3	2	1	1	1	2	2	2	2	2
5	B/O RAJESWARI	1	1	1857772	4 KG	N	14.10.18	BREATHLESSNESS	NIL	3:00 PM	2	4	3	3	2A	3	3	2	2	2	2
6	B/O SANDHYA	1	2	1913321	4.5 KG	N	12.4.19	BREATHLESSNESS	NIL	1.15 PM	2	4	3	3	2A	3	3	2	2	2	2

CRT_I	LS_I	BP_I	PP_I	AVPU_I	PUPILS_I	DEM_I	TONE_I	CSE_I	SHOCK TYPE_CI	FLUID STATUS_CI	CC-RV	CC-LV	PE_I	IVC/ AORTA_I	COLLAPSIBILI TY_I	LUNG_I	FFA_I	DIAGNOSIS	DURATION OF HOSPITAL STAY	SURVIVAL NON SURVIVAL
2	2	2	2	2	1	1	1	1	4C	2	2	3	1	3	2	4	1	RIGHT SIDED SPONTANEOUS PNEUMOTHORAX	1	2
2	2	2	2	2	1	1	1	1	4C	2	2	3	1	3	2	4	1	BRONCHOPNEUMONIA/RIGHT SIDED PNEUMOTHORAX	2	1
2	2	2	2	2	1	1	1	1	4C	2	2	3	1	3	2	2	1	RIGHT SIDED PYOTHORAX	3	1
2	2	2	2	2	1	1	1	1	4C	2	3	3	2	3	2	1	1	PYOPERICARDIUM	1	2
2	2	2	2	2	1	1	1	1	4C	2	2	3	1	3	2	4	1	RIGHT SIDED SPONTANEOUS PNEUMOTHORAX	1	2
2	2	2	2	2	1	1	1	1	4C	2	2	3	1	3	2	4	1	RIGHT SIDED SPONTANEOUS PNEUMOTHORAX	2	1

CARDIOGENIC SHOCK	NAME	AGE	GENDER	RR	ADDED SOUNDS (CREPS)	HEART SOUND	LIVER SPAN	LV CONTRACTILITY	IVC/ AORTA_I	COLLAP SIBILITY_I	LUNG_I
1	YUKESHWARAN	4	1	3	1	4	2	2	3	2	1
2	NAVEENKUMAR	2	1	3	3	4	2	2	3	2	3
3	SAVIYASRI	2	2	3	1	1	2	3	3	2	1
4	ASHVIN	2	1	3	1	1	2	3	3	2	3
5	NITHISH	2	1	3	3	4	2	2	3	2	3
6	NANCY	1	2	3	3	3	2	3	3	2	3
7	SADANA	2	2	3	3	3	2	2	3	2	1
8	PAVITHRA	2	2	3	1	1	2	2	3	2	3
9	RAJESH	1	1	3	3	4	2	2	3	2	3
HYPOVOLEMIC SHOCK											
10	HEMANNATHAN	2	1	3	3	4	2	2	3	2	1
11	DHASWANTH	2	1	3	3	1	2	2	3	2	3
12	FARHANA FATHIMA	1	2	3	1	1	2	2	3	2	1
13	KASHIKA	2	2	3	3	4	2	2	3	2	3
14	MOHAMED ABDUL	2	1	3	1	1	2	3	3	2	1
SEPTIC SHOCK											
15	B/O VARALAKSHMI	1	1	3	3	1	1	2	3	2	3
16	MITHRAN	1	1	3	3	1	2	2	3	2	1
17	B/OSATHYA	1	1	4	1	1	2	3	3	2	1
18	DHARSITH	1	1	4	3	4	2	2	3	2	3
19	JOSFEN	1	1	4	3	1	2	2	3	2	3
20	ROOPESH	1	1	3	3	4	2	2	1	2	3
21	JOE	4	1	3	3	1	2	2	3	2	1
22	B/ORAJESHWARI	1	1	3	3	4	2	2	3	2	3
23	B/OLAKSHMI	1	1	3	3	4	2	2	1	2	3
24	RANJAN	1	1	3	3	1	2	2	3	2	3

FREE FLUID IN PERITONEUM	INOTROPES	VENTILATED	DIAGNOSIS	DURATION OF HOSPITAL STAY	SURVIVAL NON SURVIVAL
1	11	0	VENTRICULAR TACHYARRHYTHMIA	2	1
1	11	11	SCORPION STING WITH ENVENOMATION	2	1
1	11	11	SCORPION STING WITH ENVENOMATION	1	2
1	11	11	SCORPION STING WITH ENVENOMATION	2	1
1	11	11	VIRAL MYOCARDITIS	1	2
1	11	11	VSD/CCF	2	1
1	11	11	CHD/CCF	2	1
1	11	11	SCORPION STING WITH ENVENOMATION	1	2
1	11	11	VIRAL MYOCARDITIS	1	2
1	2	2	DIABETIC KETOACIDOSIS/CEREBRAL EDEMA	1	2
1	3	3	POST HEMORRHAGIC HYDROCEPHALUS	1	2
1	3	3	EHPO/GI BLEED	1	2
1	3	3	MEDULLOBLASTOMA /OPERATED	2	2
1	3	3	ADD WITH SEVERE DEHYDRATION	1	1
1	2	2	LATE ONSET SEPSIS /SEPTIC SHOCK	3	1
1	3	11	BRONCHOPNEUMONIA/REFRACTORY SEPTIC SHOCK	2	2
1	2	11	LATE ONSET SEPSIS /SEPTIC SHOCK	2	2
1	4	4	BRRONCHOPNEUMONIA/REFRACTORY SEPTIC SHOCK	1	2
2	3	11	LATE ONSET SEPSIS /SEPTIC SHOCK	1	2
1	4	4	LATE ONSET SEPSIS /SEPTIC SHOCK	1	2
2	3	3	ACUTE ENCEPHALITIS	1	2
1	2	2	LATE ONSET SEPSIS /SEPTIC SHOCK	3	1
2	2	2	LATE ONSET SEPSIS /SEPTIC SHOCK	3	1
1	3	11	LATE ONSET SEPSIS /SEPTIC SHOCK	1	2