APPLICATION OF A PROGNOSTIC SCALE TO PREDICT THE MORTALITY OF CHILDREN HOSPITALISED WITH COMMUNITY ACQUIRED PNEUMONIA IN A TERTIARY CARE HOSPITAL

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CHENNAI

INSTITUTE OF CHILD HEALTH AND HOSPITAL FOR CHILDREN MADRAS MEDICAL COLLEGE CHENNAI

MAY 2020

CERTIFICATE

This is to certify that the dissertation titled **"APPLICATION OF A PROGNOSTIC SCALE TO PREDICT THE MORTALITY OF CHILDREN HOSPITALISED WITH COMMUNITY ACQUIRED PNEUMONIA IN A TERTIARY CARE HOSPITAL"** submitted by Dr.K.KARTHIK to the Faculty of Pediatrics**,** THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY, CHENNAI, in partial fulfillment of the requirements for the award of M.D., DEGREE (PEDIATRICS) is a bonafide research work carried out by him under our direct supervision and guidance.

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DECLARATION

I, DR.K.KARTHIK solemnly declare that the dissertation titled **"APPLICATION OF A PROGNOSTIC SCALE TO PREDICT THE MORTALITY OF CHILDREN HOSPITALISED WITH COMMUNITY ACQUIRED PNEUMONIA IN A TERTIARY CARE HOSPITAL"** has been prepared by me.

This is submitted to the Tamil Nadu DR.M.G.R Medical University**,** in partial fulfillment of the rules and regulations for the M.D Degree examination in Pediatrics.

Place : Chennai **DR.K.KARTHIK**

Date :

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INSTITUTIONAL ETHICS COMMITTEE
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CERTIFICATE OF APPROVAL

To
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Dear Dr. K. KARTHIK,

The Institutional Ethics Committee has considered your request and approved your study titled **"APPLICATION OF A PROGNOSTIC SCALE TO PREDICT THE MORTALITY OF CHILDREN HOSPITALIZED WITH COMMUNITY ACQUIRED PNEUMONIA IN A TERTIARY CARE HOSPITAL" - NO.12032018**

The following members of Ethics Committee were present in the meeting held on **27.03.2018** conducted at Madras Medical College, Chennai 3

1. Prof.P.V.Jayashankar :Chairperson
2. Prof.R.Jayanthi,MD.,FRCP(Glasg) Dean,MMC,Ch-3 : Deputy Chairperson
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14. Thiru K.Ranjith, Ch- 91 : Lay Person

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

Member Secretary – Ethics Committee

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CERTIFICATE II

This is to certify that the dissertation work titled, **APPLICATION OF A PROGNOSTIC SCALE TO PREDICT THE MORTALITY OF CHILDREN HOSPITALISED WITH COMMUNITY ACQUIRED PNEUMONIA IN A TERTIARY CARE HOSPITAL** of candidate **Dr.K.KARTHIK** with registration number **201717006** for the award of M.D.Paediatrics(branch VII).I personally verified the **urkund.com website for the purpose of plagiarism checking**.I found that the uploaded thesis file shows **16 percentage** of plagiarism in the dissertation.

Guide and supervisor sign with seal.

ABBREVIATION

ICH & HC– Institute of Child Health and Hospital for Children , Egmore.

WHO – World Health Organisation.

CAP-Community Acquired Pneumonia.

CRP- C reactive protein.

CXR-Chest x ray.

ABG-Arterial Blood Gas analysis.

PT- prothrombin time.

INR- International Normalized Ratio.

aPTT-Activated partial thromboplastin time.

IAP - Indian Academy of Pediatrics.

sPO2 – Oxygen saturation .

PaO2-Partial pressure of oxygen.

mg/dl – milligrams per decilitre.

mmol/L – milli-moles per litre.

mmHg – millimetres of mercury.

AUC – Area under the curve.

SBP – Systolic blood Pressure.

DBP – Diastolic blood pressure.

MAP – Mean arterial pressure.

ALF _ Acute Liver Failure.

ARF _ Acute Renal Failure .

SGOT _ Serum Glutamate Amino Transferase.

SGPT _ Serum Alanine Amino Transferase.

PIRO - Predisposition , Insult , Response , Organ dysfunction.

ROC - Receiver operating characteristic curve.

CONTENTS

INTRODUCTION

INTRODUCTION

- Pneumonia[1] is one of the most common causes of morbidity and mortality in young children of less than 5 years in India.
- Child Health Epidemiology Reference Group (CHERG)[1] which was established by World Health Organisation (WHO)[1] have put forth the estimates of morbidity and mortality and also identified risk factors like lack of immunization, lack of breast feeding, malnutrition, low birth weight contributing to pneumonia mortality.
- India contributes 23% of world's total pneumonia and have an incidence of 0.37 episodes per child-year for clinical pneumonia[1,2,3,28,33].
- Nearly half of the death are due to infectious disease of under 5 mortality[2] , majority contributed by diarrhoea and pneumonia.
- The implementation of affordable and effective intervention has saved many morbidity and mortality due to pneumonia.
- This intervention has drastically reduced mortality from four million to one million over 20 decades.

- Various recommendations were modified accordingly in health facility as a result of studies being conducted in low and middle income countries which had largest burden on pneumonia.
- Integrated management of childhood illness (IMCI) at community heath level was modified accordingly.
- Majority of death due to pneumonia is because of severe disease (severe pneumonia)[1,34] .
- Hence early case identification and appropriate referral and timely intervention can decrease the overall morbidity and mortality.

DEFINITION OF PNEUMONIA

WHO definition:

- Child with cough and cold with no fast breathing/chest indrawing:No Pneumonia.
- Fast breathing or chest indrawing : Pneumonia.
- Pneumonia with danger signs : Severe or Very severe Pneumonia.

ETIOLOGY AND PATHOGENESIS OF PNEUMONIA[4,5,6]:

ENVIRONMENTAL FACTORS:

Pneumonia may be classified anatomically as lobar or lobular pneumonia , bronchopneumonia, and interstitial pneumonia.

Pathologically , there is consolidation of alveoli or infiltration of interstitial tissue with inflammatory cells or both.

ETIOLOGY[4,5,6]:

- A viral etiology, chiefly RSV, influenza, parainfluenza or adenovirus is present in 40 % patients. In over two thirds of patients, a bacterial etiology is identified. Common bacterial agents in the first 2 months of life include gram negative (klebsiella, Escherichia coli) and gram positive organism (pneumococci , staphylococci). Between 3 months to 3 years, the chief bacterial organisms are Pneumococcus Pneumoniae, Hemophilus influenza and Staphylococcus aureus (Methicillin Sensitive and Methicillin Resistant Staphylococcus aureus).
- Chlamydia and Mycoplasma species may cause community acquired pneumonia in adolescents and children. Gram negative organism cause pneumonia in early infancy, severe malnutrition ,and immunocompromised children .
- Pneumocystis jirovecii and Histoplasma may also cause pneumonia in the immunocompromised . The etiology remains unknown in one third cases.

CLINICAL FEATURES:

Risk factors[4,5,6,29,31,35]:

- Low birth weight, malnutrition , Vitamin A deficiency , lack of breast feeding , passive smoking , large family size , family history of bronchitis, advanced birth order , overcrowding , young age and air pollution, lack of immunization . Indoor air pollution is a major risk factor for acute lower respiratory tract infection in children in developing countries.
- Onset of pneumonia may be insidious starting with high grade fever , tachypnoea , dyspnea, grunting respiration. There is flaring of alar nasi and retractions of lower chest and intercostal muscles. Signs of consolidation are observed in lobar pneumonia.

Pneumococcal pneumonia[7]:

- Respiratory infection caused by streptococcus pneumoniae are transmitted by droplets and common in winter months. Incubation period is 1-3 days. Onset is abrupt with high fever, chills and respiratory symptoms.
- Referred pain to abdomen can also occur. Fast breathing , chest indrawing and grunting , feeding difficulty , cyanosis can occur.
- Treatment is ceftriaxone , cefotaxime , co amoxiclav.

Staphylococcal pneumonia:

- Staphylococcal pneumonia occurs in infancy and childhood. May be a complications of measles, cystic fibrosis, chronic debilitating disease ,pyoderma .
- Characterized by suppurative microabscess and erosion of bronchial walls and formation of pneumatoceles . Empyema less than 2 years is nearly always staphylococcal etiology. Primary disease may be associated with disseminated disease with abscess in joints, bone, muscles, pericardium, liver, mastoid, brain.
- Treatment is ceftriaxone, co amoxiclav, cloxacillin . MRSA – Vancomycin , Linezolid , Clindamycin.

Hemophilus pneumonia :

- Infection begins in the nasopharynx and spreads locally through blood. Patient present with moderate fever , dyspnea, grunting and retractions. Presentation may mimic acute bronchiolitis

Treatment is ceftriaxone , ampicillin , amoxiclav.

Primary atypical pneumonia:

- Mycoplasma , chlamydia , legionella are small , free living organism.
- Incubation period is 12 – 14 days. Initial symptoms are malaise , fever , sore throat, myalgia , headache . Cough is dry at first but later mucoid expectorant .

Dyspnea is unusual . Cold agglutinin are elevated in 30-60%. Hemolytic anemia are uncommon.

- X ray finding are more extensive than physical signs. Infiltrates involve one lobe , usually lower. Poorly defined hazy or fluffy exudates radiates from hilar regions , occasionally with enlarged lymph nodes .
- PCR is the diagnostic procedure of choice.
- Macrolides and Tetracycline are drug of choice.

Viral pneumonia:

- Respiratory Syncytial Virus (RSV) is the chief cause under 6 months. Parainfluenza , Influenza , Adenovirus are common presenting with extensive interstitial pneumonia . Clinical signs of consolidation are absent . Radiological signs consists of perihilar and peribronchial infiltrates.

PNEUMOCOCCAL VACCINES

- Pneumococci can cause severe and non severe disease.
- It frequently colonize the upper respiratory tract.
- Invasive Pneumococcal Disease (IPD) is a condition in which pneumococci invades Blood stream (bacteremia) and reaches other sites.

- It can also reach adjacent structures and rest in otitis media and mastoiditis, sinusitis which are referred to as non severe form.
- Severe forms were pneumonia, meningitis.
- Case fatality rate is 20 % for pneumonia and 50 % for meningitis.
- The risk factors contributing to these are indoor air pollution, lack of exclusive breast feeding, malnutrition and age less than 2 years, congenital heart disease, established lung disease, asplenia, HIV, immunodeficiency.
- The significance of knowing prevalence of distribution of different pneumococcal serotypes in the community is immense since the serotypes have distinct personality and represented a distinct disease.
- Serotypes 6,14,18,5,19 and 1 were the most frequent serotypes.
- PCV 13[46] contains polysaccharides of capsular antigens of Streptococcal pneumoniae serotypes 3,6A ,19A in addition to other polysaccharides vaccines.
- When the introduction of PCV 10 the serotype 19 A was rising with increased antibiotic resistance and invasive pneumococcal disease.
- In order to overcome the burden the 3 , 6A, 19A which are the causes of invasive pneumococcal disease like bacteremia , meningitis , pneumonia world wide. PCV 13 introduced.
- PCV 10 and PCV 13 gives protection to non severe diseases like otitis media , sinusitis.

- The coverage of PCV 10^7 and PCV 13 were 63.89 % and 91.57% among 36 pneumococcal antigens .
- Recommended schedule is from 6 months to 5 years.
- Primary series for 6 weeks to 6 months – Three primary doses and one booster dose given at 12 to 15 months.
- For 7 – 11 months : Two doses of primary and one booster dose at 12 to 15 months.
- For 12-23 months : Two doses of primary dose.
- 24-59 months: One primary dose.
- Primary series should be given 8 weeks apart and booster should be given at 6 months of primary series.
- PPSV23:
- Minimum age : 2 years.
- Not recommended for routine use in healthy individuals.
- Given in patients with congenital heart disease , chronic lung disease , asplenia , cochlear implant .
- It is given at least 8 weeks after the last dose of PCV to children aged 2 years or older with certain medical conditions.
- Vaccination uptake and increased of vaccine serotypes can reduce the burden of pneumococcal pneumonia.
- 85 % decrease in serotype circulation attained after 5 years vaccination in Israel.

- After the introduction of PCV 13 there is overall coverage of 57% in otitis media serotype.

TREATMENT OF PNEUMONIA[1,7,25,26.]:

- Fast breathing pneumonia requires oral amoxicillin[1,7] (80mg/kg/day) for three days.
- Chest indrawing pneumonia requires oral amoxicillin (80mg/kg/day) for five days.
- Children with fast breathing or chest indrawing pneumonia who failed to respond to oral amoxicillin should be referred where there is appropriate second line treatment.
- Children aged 2-59 months with severe pneumonia should be treated with parenteral antibiotics ampicillin 200 mg/kg/day and gentamicin 7.5 mg/kg/day for five days.
- Ceftriaxone is used as second line agent who failed to first line treatment.
- Cotrimoxazole treatment for suspected pneumocystis jirovecii pneumonia is recommended as additional treatment for Retro viral positive children and exposed infants aged from 2 months to 1 year with severe or very severe pneumonia.
- Empirical cotrimoxazole is not advisable for children over 1 year of age with severe or very severe pneumonia.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

- **STUDY 1**
- **Title :"To construct a prognostic scale for prediction of mortality in children hospitalized with community acquired pneumonia[8]".**
- "Soraya Araya, MD,*† Dolores Lovera, MD,*† Claudia Zarate, MD,*† Silvio Apodaca, MD,*†Julia Acuña, MD,*† Gabriela Sanabria, BS,* and Antonio Arbo, MD, MSc*†"
- Its a retrospective observational study based on medical records reviews of patients diagnosed with community acquired pneumonia on admission and hospitalized in the period of January 2004 and June 2013.
- Age less than 15 years were included in the study.
- A point based scoring system used in adult patients with pneumonia was applied to each child hospitalized with community acquired pneumonia based on the modification of Predisposition , Insult , Response and Organ dysfunction score (PIRO).
- Results :
- The association between the modified PIRO score and mortality was assessed by stratifying patients into 4 groups :
- Low (0-2 points) score
- Moderate (3-4 points) score

- High (5-6 points) score
- very high score (7-10) score

- 860 children hospitalized with CAP were included for the study based on the inclusion criteria . The mean age was 2.8 to 3.2 yrs. The observed mortality was 6.5 % (56/860). Mortality ranged from 0 % for a low score (0/708), 18 % (20/112) for a moderate score , 83 % (25/30) for a high score , 100 % (10/10), for a very high score.

- **STUDY 2**

- **Title :"Risk Factors for Mortality in Community –Acquired Pneumonia Among**
- **Children Aged 1-59 Months Admitted in a Referral Hospital[9]".**

- **"PADMANABHAN RAMACHANDRAN, KRISHNAMOORTHI NEDUNCHELIAN, APPASAMY VENGATESAN AND SARADHA SURESH"**

- Its a hospital based retrospective study design done in Institute of Child health and Hospital for Children .
- Objective :
- To determine the case fatality rate.

- To delineate the risk factors associated with mortality in children aged 1 to 59 months admitted in the referral hospital.
- Age , gender , fast breathing , chest indrawing , altered level of consciousness , malnutrition , shock , cardiac illness , recent viral exanthem and need for ventilation were assessed in this study.
- Results : Case fatality rate was 8.2 % (95% CI : 7.37 -8.99 %).Need for assisted ventilation alone was found to be an independent risk factor for mortality. Other risk factors like young age , weight fir age <-2 Z score , altered level of consciousness , congenital heart disease were also observed among these groups.

- **STUDY 3**
- **Title :"Performance of the PIRO score for predicting mortality in patients with ventilator-associated pneumonia"[10].**
- "G. H. FURTADO*, D. E. WISKIRCHEN†, J. L. KUTI‡, D. P. NICOLAU§"

- Its a prospective observational study design .
- The aim of this study design was to compare the PIRO score against the Acute Physiology And Chronic Health Evaluation (APACHE) 11 amd VAP APACHE 11 in an independent group of VAP patients.
- Area under the Receiver Operating Characteristic curve (ROC) for comparing mortality and predicting mortality with PIRO , APACHE 11 and VAP APACHE11 were done.

- P values of PIRO (0.605 =0.03), P value of APACHE 11 (0.631=0.01) , P value of VAP APACHE 11 (0.724=<0.0001) were compared.
- No differences were noted in the prediction of mortality in PIRO and APACHE 11 and VAP APACHE 11.

- **STUDY 4:**
- **Title :"PIRO score for community acquired pneumonia : a new prediction rule for assessment of severity in intensive care unit patients"[11] .**
- *"Rello J , Rodriguez A, Lisboa T , Gallego M, Lujan M, Wunderink R".*
- It's a secondary analysis of prospective observational cohort study design.
- This study was conducted in thirty three ICU settings and 529 adult patients with pneumonia requiring admission in intensive care unit.
- Objective :
- To construct a prognostic tool in predicting mortality in patients in intensive care unit and comparing it with Acute Physiology And Chronic Health Evaluation (APACHE 11) score and American Thoracic Society/ Infectious Diseases Society of America (ATS/IDSA) criteria.
- Results :
- PIRO was done at the time of admission in intensive care patients and points were allotted as 0-8.

- As Score progress the p value becomes statistically significant which was analysed by cox proportional hazards regression analysis.
- Low score (0-2) had p value of <0.05.
- Mid score (3-4) had p value of <0.05
- High score of 4 had p value of <0.001
- Very high score of (5-8) had p value of <0.001
- Other factors like prolonged stay during the illness in the hospital , prolonged days of mechanical ventilation were also associated with significant mortality .
- PIRO score performed well as 28 day mortality prediction tool in CAP patients requiring ICU admission with better performance than APACHE and ATS/IDSA .

- **STUDY 5**
- **Title :"Hypoxemia in Children with Pneumonia and Its Clinical Predictors"[12]**
- "Sudha Basnet, Ramesh Kant Adhikari and Chitra Kumar Gurung"
- Department of Pediatrics, Department of Community Medicine and Family Health, Institute of Medicine, Kathmandu, Nepal
- Its cross sectional study design conducted in the year 2000 in kantu hospital.
- Children in the age group of 2 to 60 months were included . Those with breathing difficulty were assessed . Hypoxemia was defined by SpO2 of less than 90 % detected by pulse oximetry. Children with pneumonia were grouped into three major categories as pneumonia , severe pneumonia and very severe pneumonia.

- Results. The prevalence of hypoxemia (SpO2 of < 90%) was 38.7% in children hospitalized with pneumonia . Of those children hospitalized 100% of very severe pneumonia, 80% of severe and 17% of pneumonia patients were hypoxic. The association of Infants and hypoxemia (Odds ratio = 2.21, 95% CI 1.03, 4.76) were significantly higher. Clinical predictors significantly associated with hypoxemia were lethargy, grunting, nasal flaring, cyanosis, and poor feeding . Chest indrawing with 68.9% sensitivity and 82.6% specificity was the best predictor of hypoxemia.

- ***STUDY* 6**
- **Title :"Prediction of clinical severity and outcome of ventilator associated pneumonia in a tertiary hospital using the VAP PIRO scoring system"[13]**
- "Roland panaligan , Christine Chavez , Mario Panaligan"
- Methods:
- It's a prospective observational study conducted in a tertiary hospital.
- This study included 52 patients with VAP.
- VAP PIRO was compared with APACHE and to discriminate the mortality of VAP PIRO was assessed by ROC analysis.
- Results :
- The VAP PIRO score showed a good discrimination for assessing mortality (AUC 0.759) and was comparable to APACHE (Z statistic = 0.0504; p=0.96).

- This study showed that the VAP PIRO scoring system is a good practical clinical tool that could substitute the complex and costly APACHE in predicting severity and outcome of illness.

- **Study 7**
- **"Title : Increased risk of Acute Kidney injury following Pneumococcal pneumonia : A nationwide Cohort study"[14]**
- "Author : Te-Yu Lin , Yu-Guang Chen , Cheng – Li Lin , Chia -Hung Kao"
- Method :
- It's a Cohort study design composed of 10069 Pneumococcal pneumonia patients as cases and 10069 non pneumococcal pneumonia patients as control .
- This study was conducted in the period of 2000-2011.
- RESULTS:
- The cumulative incidence of "AKI was higher for the pneumococcal pneumonia cases compared to non – pneumococcal pneumonia". P value is 0.006 which is statistically significant .
- The risk of AKI in the patients with pneumococcal pneumonia with sepsis was significantly higher compared to non pneumococcal pneumonia without sepsis .
- AKI was also increased in patients with cirrhosis , diabetes , hypertension than with those with no co-morbidity.

- **STUDY 8**
- **"Title : Impact of Acute kidney Injury in Patients Hospitalized with Pneumonia."[15]**
- "Author: Chawla LS, Amdur RL, Faselis C, Li P, Kimmel PL , Palant CE".
- It's a retrospective analysis conducted in the period of 1999 to 2005 in veterans database.
- Patietns were grouped into 3 categories as 1)acute kidney injury
- 2) pneumonia , 3) Acute kidney injury with pneumonia.
- Results :
- Significant mortality were observed in all the three groups , 25 % decrease in Glomerular Filtration Rate from baseline , major adverse kidney events during admission (all had p value of <0.0001).
- Persons hospitalized with pneumonia and develop Acute Kidney Injury was associated with poor outocome .

- **STUDY 9**
- **"Title : Epidemiology and outcome of acute Kidney injury from a tertiary care hospital in India".[16]**
- "Author : Sanjay Vikrant , Dalia Gupta , Mehakinder Singh"
- It's a prospective study design conducted in adult patients over a period of 6 months.

- Results :
- Incidence of AKI was 8 per 1000 admission.
- Medical causes contributing to AKI were 87.4 %, surgical causes were 9.4 % , Obstetric causes were 3.2 %.
- Sepsis was the most common cause of AKI .
- Sepsis contributes to 53.1 % of causes , Pneumonia constitutes around 9.1 % of patients following scrub typhus (18%) and UTI (14%).
- Among this , 20.1 % of patients needed treatment with vasopressor drugs , 6.1 % of patients needed ICU support , and 23.3 % of patients needed dialysis .
- 91.3 % of patients with AKI survived an 8.7 % patients with AKI was succumb to death.

- **STUDY 10**
- **"Title : Model for end stage liver disease and pneumonia : An improved scoring model for critically ill cirrhotic patients with pneumonia"[17] .**
- "Author : Feng Gao , Meng-Xing Cai , Miao-Tong Lin , Ling-Zhi Zhang , Qian-Zi Ruan and Zhi-Ming Huang".
- Study design :
- Patient dataset was extracted from a Medical Information Mart Intensive Care 111 between 2001 to 2012.

- A total of 231 patients were enrolled in our study . Model for End – Stage Liver Disease and Pneumonia (MELD-P) were compared and followed up for 21 days.
- Results :
- MELD – P showed better discriminative capabilities than existing scoring systems. Four clinical variables were assessed – bilirubin , INR , pulse oxygen saturation/fraction of inspired oxygen and vasopressor.
- These clinical variables were considered as independent prognostic values associated with 21-day mortality .
- MELD-P had ROC curve values of 0.78 in predicting mortality , 0.87 at 7 day, 0.88 at 14 day , 0.78 at 21 day.
- Conclusion :
- MELD-P performed well as short term mortality in critically ill patients with liver disease.

- **STUDY 11**
- **"Title : Patients with community acquired pneumonia admitted to European intensive care units : an epidemiological survey of the GenOSept cohort"[18]**
- "Author : Andrew P Walden , Geraldine M Clarke , Charles J Hinds"
- Methods:
- A total of 1166 patients were enrolled in this study design . Kaplan – Meier analysis was used to determine mortality rates. A Cox Proportional Hazards model

was used to identify variables independently associated with 28 day and six month mortality.

- Results:
- Community acquired pneumonia is the most common infectious reason for admission to the Intensive Care Unit .
- Ventilator support , presence of diffuse pulmonary infiltrates , lower hematocrit , urine output and pH on admission were independent predictors of a worse outcome.
- Mortality at 28 days were 17 % , rising to 27 % at six months.

- **STUDY 12**
- **"Title : Invasive mechanical ventilation in community acquired pneumonia"[19]**
- Author : "Catia Cilloniz, Miquel Ferrer , Eva polverino , Albert Gabarrus"
- Methods:
- Prospective study for 12 years enrolled 3719 patients.
- Results:
- Among these patients , 154 patients required (4%) Invasive mechanical ventilation , 136 patients(4%) Non invasive ventilation , 3429 patients (92%) were not ventilated.

- High level of CRP , worse oxygen saturation from baseline , higher pneumonia severity index , and the bacteremia were independent predictor of need for invasive mechanical ventilation .

- **STUDY 13**
- **"Title : Severe pneumonia requiring ICU admission"[20].**
- Author : "Hadil A , AlOtair ABIM et al"
- Methods:
- Prospective observational study of 119 patients were admitted in ICU with community acquired pneumonia.
- Results :
- ICU mortality was 24.4 % .
- Most common organism isolated were H1N1 (23 %) and Pneumococcal pneumonia (17 %).
- The outcome of patients with severe pneumonia admitted to ICU had better outcome.
- Early administration of combination antibiotics was practiced with vigilance .
- Multiple regression analysis identified Septic shock , Acute respiratory distress syndrome (ARDS) , Pneumonia severity index (PSI) as significant predictors of mortality.

- **STYDY 14**
- **"Title : validation of the vasoactive – inotropic score in pediatric sepsis"[21,23.]**
- **Authors : "Amanda M.McIntosh , MD , Suhong Tong , MS ,Sara J.Deakyne , MPH, Jesse A.Davidson , MD , MPH , and Halden F.Scott, MD".**
- Objectives:
- To assess the validity of vasoactive – Inotropic score as a scoring system for cardiovascular support and surrogate outcome in pediatric sepsis.
- Design : Secondary retrospective analysis of a single centre sepsis registry.
- Children more than 2 months and less than 18 years with sepsis identified in the emergency department between January 2012 to 2015 with at least one vasoactive drug within 48 hours of admission to PICU.
- Results:
- Outcome assessed were ventilator days and duration of ICU stay.
- Secondary outcome assessed were cardiac arrest and ECMO .
- Most common infectious causes are pneumonia (32%) and bacteremia (23%).
- 33 % of patients were intubated and mortality was 6 %.
- Vasoactive inotrope score at 48 hours was a strong independent predictor of primary outcomes and intubation .
- For every unit increase in vasoactive inotropic score at 48 hours , there was a 3% increase in ICU length of stay and 8% increase in ventilator days .

- For every unit increase in inotrope at 12 hours ,there was a 14 %increase of odds of having the composite outcome.

- **STUDY 15**
- **"Prediction of Requirement for mechanical ventilation in Community – Acquired pneumonia with Acute Respiratory Failure : A multicentre Prospective study"[22,23].**
- "Kohno S[a]. Seki M.[a] . Takehara K.[b] . Yamada Y.[c] . Kubo K .[e]. Ishizaka A.[d] . Soma K .[f] ."
- Objectives :
- The requirement of mechanical ventilation and mortality was examined in community acquired pneumonia patients with acute respiratory failure by using the age , dehydration ,respiratory failure , orientation disturbance and blood pressure (A-DROP) scoring system .
- Methodology :
- Prospective , multicentre , observational cohort study. Pneumonia severity were assessed using A-DROP and PSI scoring . Requirement of mechanical ventilation and mortality was assessed at 28 days .
- Results : 482 patients were enrolled in this study.
- 28 day mortality was 12.3 %.

- 28 day mechanical ventilation rate was 14.4%. But mortality was 50 % among ventilated patients.
- Incidence of ARDS was 10% and ICU admission rate was 8.7%.
- The mortality of hospitalized CAP patients were 10 – 25% , the mortality rate of severe CAP ranged from 22 – 54 %.
- **STUDY 16**
- **Title : "The current status of community acquired pneumonia management and prevention in children under 5 years of age in India" : A review**
- **Methodology :** Systematic review
- **Inclusion criteria :** children aged 2-59 months .
- **Outcome variables :** Pneumonia mortality , incidence , etiology , risk factors and preventive measures and control.

- **Results :**
- Pneumococcal pneumoniae and Hemophilus influenzae were common pathogens causing pneumonia .
- Lack of exclusive breast feeding, indoor air pollution, malnutrition, iron deficiency anaemia, inappropriate complementary feedings should be addressed.
- Community should be taught of signs and symptoms of pneumonia.
- Effective vaccination strategies.
- To achieve SDG of < 25 / 1000 under five death in 2030.

STUDY JUSTIFICATION

- India has the highest number of global death of children of under- five mortality[36]. Over 5.9 million death occurred worldwide, our country constitutes to 20% of it.
- Nearly half of the death are due to infectious disease of under 5 mortality, out of which half of the death are due to diarrhoea and pneumonia[37].
- Present under five mortality is 39.4/1000 children. (UNICEF)
- Proportion of under – five children with suspected pneumonia taken to health provider is 73 % . (UNICEF)
- One of the SDG goal is to achieve a under- five mortality of 25/1000 by the year 2030.
- In 2010 , 3.6 million episodes of severe pneumonia and 0.35 million all cause pneumonia death in children younger than 5 years in India.
- The estimated incidence of severe pneumonia was 30.7 per 1000 children per year in those less than 5 years of age, and 87.3 per 1000 in children aged less than 1 year.
- Hence by applying a prognostic scale[38] we can able to categorize the patient as low risk , moderate risk , high risk and very high risk at the time of admission and patient can be categorized for IP admission and ICU admission.

- Hence in order to achieve this goal , a multimodal approach needed to reduce the mortality.
- A number of points scales have been identified for measuring the severity of community acquired pneumonia . These scales stratify patients into different mortality risk classifications based on demographic , clinical and laboratory findings.
- MODIFIED PIRO scale which is based on Predisposition , Insult , Response , Organ dysfunction includes aspects of host response to the infection as well as predisposing conditions, in recognition that immunodeficient or chronically ill children represent a significant proportion of real population.

AIMS AND OBJECTIVE

OBJECTIVE

- The association of PIRO score and its prediction on mortality in children hospitalized with community acquired pneumonia.

METHODOLOGY

STUDY DESIGN : PROSPECTIVE OBSERVATIONAL STUDY

STUDY PERIOD : 2018-2019

STUDY PLACE : Institute of child health and hospital for children, Egmore.

STUDY POPULATION : Children in study age group admitted in ICH , satisfying the inclusion criteria

INCLUSION CRITERIA : Children age 1 – 59 months

Case defined by the presence of respiratory signs and symptoms with evidence of pneumonia in chest radiography at admission in patients who had not been hospitalized within previous 30 days.

SAMPLE SIZE : 200 (based on 15 % mortality from previous study)

EXCLUSION CRITERIA :

- Hospital acquired pneumonia

- Ventilator associated pneumonia
- Pulmonary tuberculosis
- Chemical pneumonitis
- Diagnosis not confirmed by chest radiography

ETHICS

- Informed consent from the parents and institution ethical review board was obtained.

METHODS

- **SERIAL NUMBER**
- NAME:
- AGE:
- SEX:
- I.P No:
- ADDRESS:
- PATIENT PHONE NO:
- COMPLAINTS:

- Fever
- Cough , cold , breathlessness
- Fast breathing
- Chest indrawing
- Decreased urine output
- Altered level of consciousness-lethargy, less active than usual, incessant cry, excessive sleepiness
- Seizures
- Bluish discolouration of limbs
- Ear discharge
- Skin infection
- Recent viral exanthematous fever

    - SOCIO ECONOMIC HISTORY: 1. Overcrowding
        - 2.indoor air pollution

- EXAMINATION:
- GENERAL EXAMINATION:
- Consciousness-
- Pallor -
- icterus-
- Cyanosis-
- Clubbing-
- Pedal oedema-
- Lymphadenopathy-

- Vital signs:
    - PR-rhythm , volume , character , radio radial / radio femoral delay

- RR- tachypnoea is defined as RR more than or equal to 60/min in 2 months of age , 50 or more in 2 months to 1 yr of age , 40 or more in 1 to 5 yrs of age.
- BP-
- spO2-
- temperature

- Anthropometry:
  - Height in cm-
  - Weight in kg-
  - Weight for age-
  - Weight for height-
  - Mid upper arm circumference-

- SYSTEMIC EXAMINATION

- CVS-
- RS-
- ABDOMEN-
- CNS-

- DIAGNOSIS:

- INVESTIGATIONS:
- 1.Complete hemogram:
- HB%- TC-
- DLC- PLT-

- 2.CRP
- 3.Blood culture & sensitivity
- 4.Urine culture & sensitivity
- 5.RFT,LFT , PT -INR , aPTT
- 6.Chest X-ray
- 7.ABG

MODIFIED PIRO SCALE PARAMETERS:

PREDISPOSITON: 1. Age < 6 months

2. comorbidities: Congenital heart disease , asthma, down syndrome ,malnutrition, HIV, immunodeficiency, immunosuppressant therapy ,malignancy, lack of exclusive breast feeding for 6 months.

INSULT: 1. Hypoxia : saturation by pulse oximetry less than 90%

2. Hypotension: MAP less than 5^{th} centile or less than 2SD.

3. Bacteremia : culture positivity

RESPONSE: 1. Pneumonia – lobar or bronchopneumonia

2. Complicated pneumonia – Pneumothorax , empyema, bullae,pneumatocele.

ORGAN DYSFUNCTION: 1. ARDS: Worsening of respiratory illness within one week of clinical insult with new onset bilateral fluffy opacities not fully explained by cardiac failure / volume overload . Currico index less than 300 mm hg.

2. ACUTE KIDNEY INJURY: Urine output less than 0.5ml/kg/hr for 24 hours or anuria for less than 12 hours with increased urea and creatinine.

3. ACUTE LIVER FAILURE: signs of encephalopathy, bleeding disorder , raised transaminases > 5 times normal with altered coagulation profile.

Low score : 0-2

Moderate score : 3-4

High score:5-6

Very high score:7-10

STUDY MANOEUVRE

- All children who meet the inclusion criteria are included and informed consent obtained from the parents.

- History with clinical examination ,vital signs and detailed systemic examination will be done.

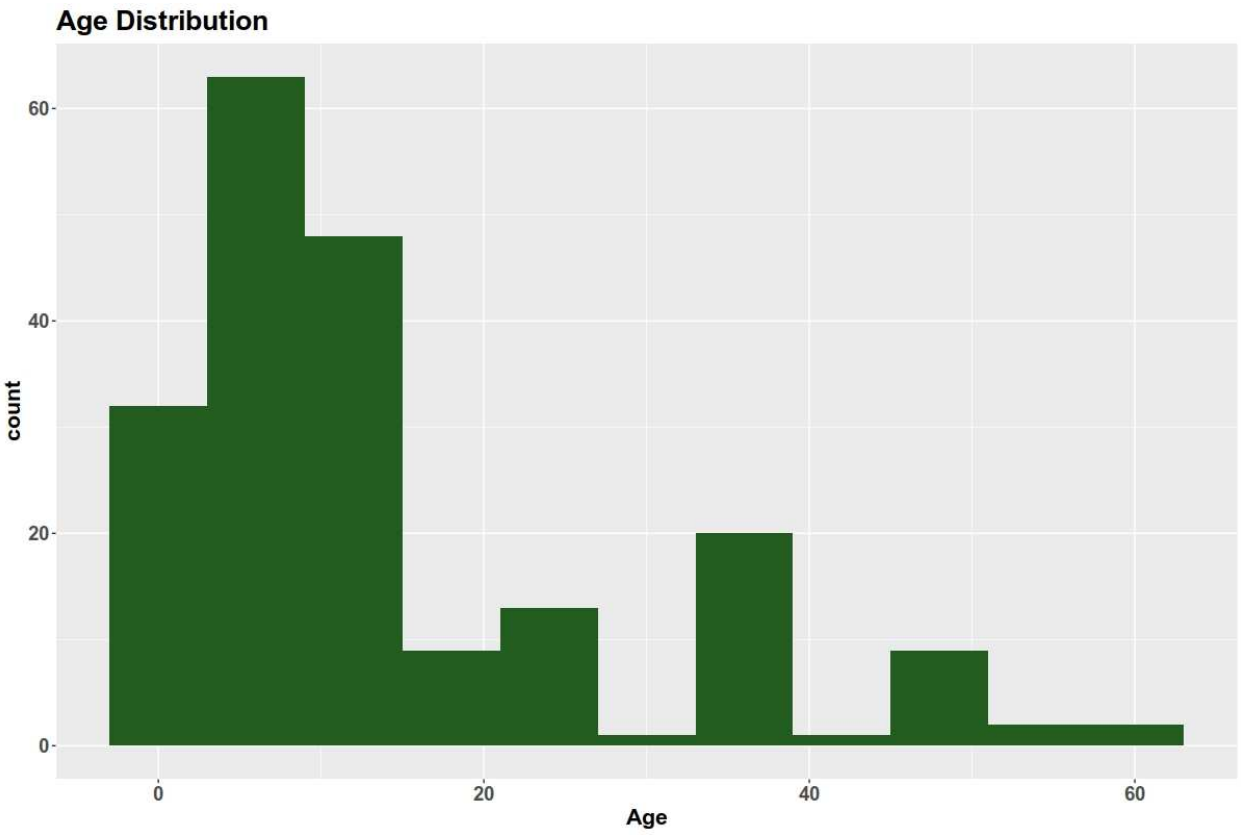
- Investigations like complete blood count, CRP, Blood culture, urine culture and sensitivity, CXR, renal function test, liver function test , coagulation profile, ABG analysis.

- **STATISTICAL ANALYSIS:**

  Data were analyzed using SPSS version 24.0. All categorical parameters were summarized using frequency and percentages. Receiver Operating Characteristic (ROC) analysis was done to find the optimal and maximal sensitivity and specificity for PIRO score to predict the pneumonia mortality in children. p value was obtained for PIRO score .

RESULTS

RESULTS:

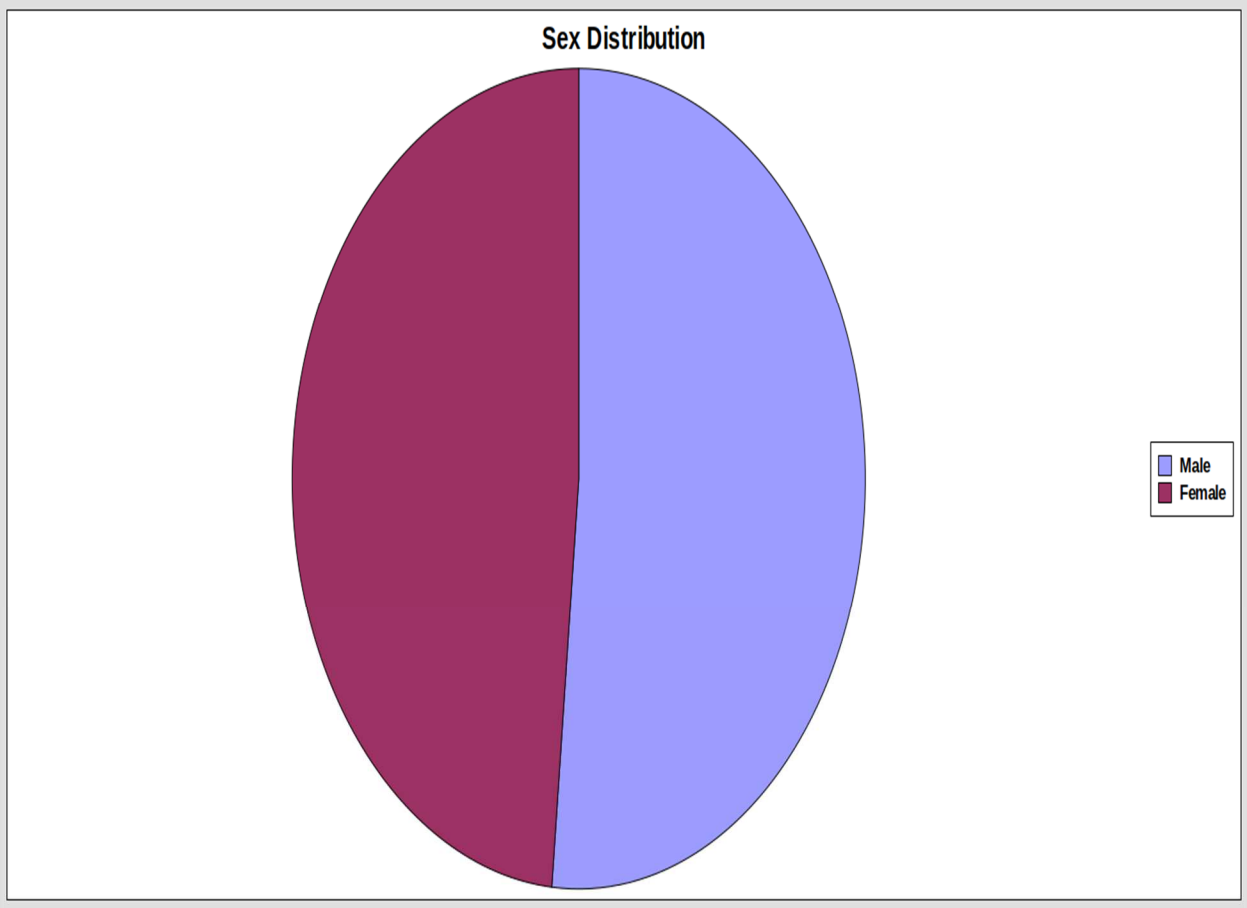


- Out of 200 children in my study ,
- 142 children with pneumonia were under 12 months.(71%)
- 25 children with pneumonia were under 24 months. (12.5%)
- 19 children with pneumonia were under 36 months. (9.5%)
- 6 children with pneumonia were under 48 months.(3%).

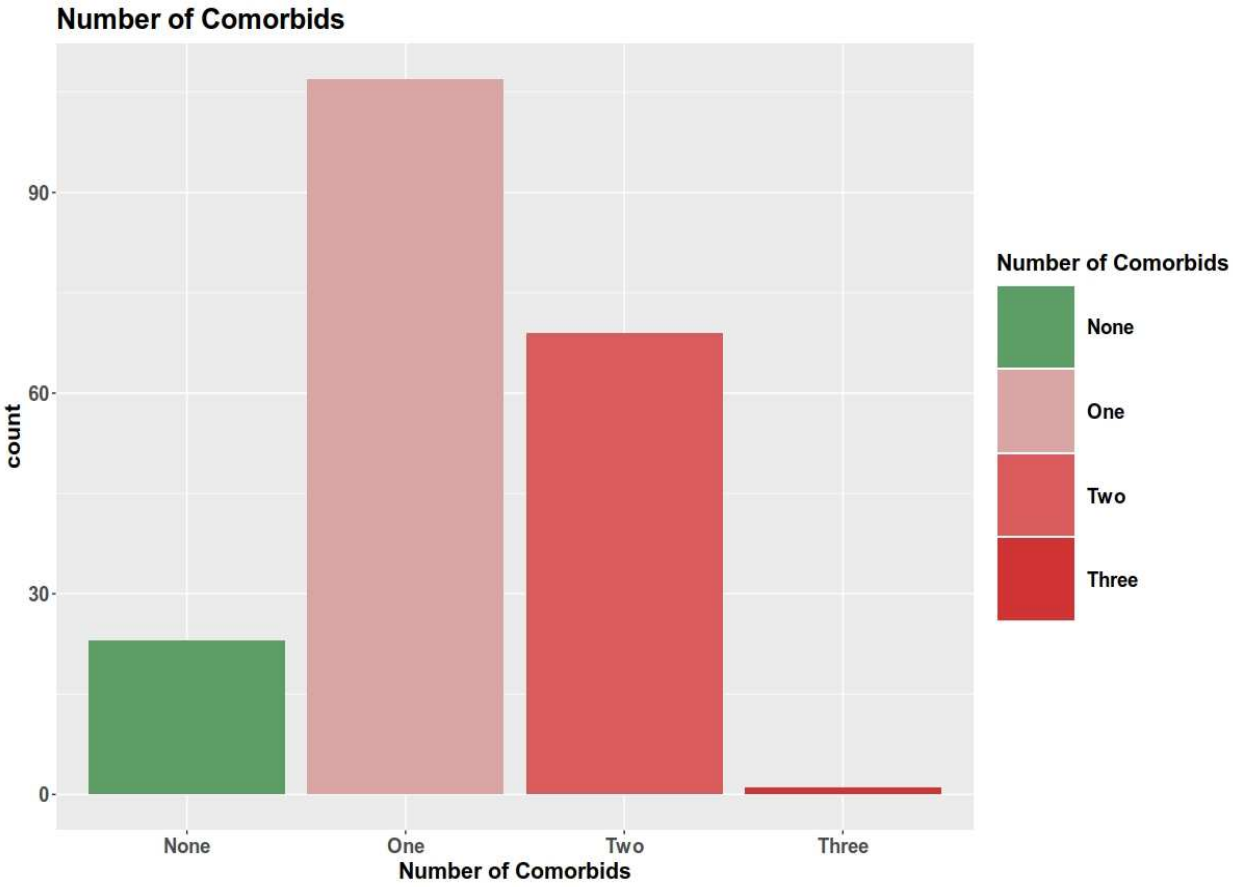
- 8 children with pneumonia were under 60 months.(4%).

- In a study conducted by **Ramachandran et al** ,
- 48 % of children were in a group of 1-6 months.
- Among mortality group ;
- 1-6 months : 228 died out of 2175 which contributes to **10.5%.**
- 7-12 months : 49 died of 798 which contributes to **6.1%**
- 12 – 24 months:34 died out of 795 which contributes to **9.3%**
- 24-59 months:46 died out of 607 which contributes to **7.6%**

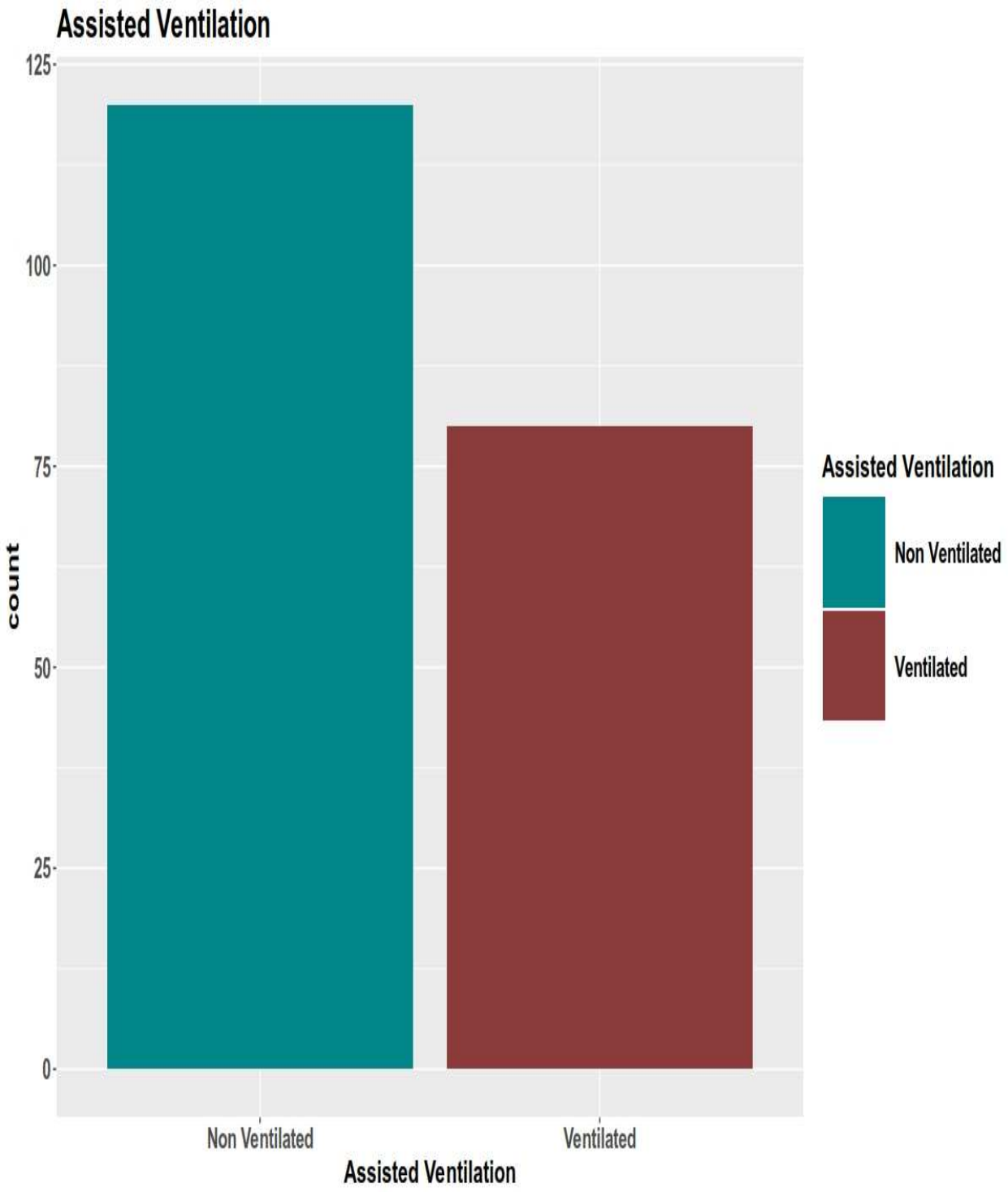
- In my study
- 1-6 months: 16 cases died out of 59 which contributes to **27%**
- 7-12 months: 8 cases died out of 83 which contributes to **9.6%**
- 12 – 24 months: 3 cases died out of 25 which contributes to **12 %**
- 24-59 months : 6 cases died out of 33 which contributes to **18 %** as a whole.
- **Infants were more prone for pneumonia and high mortality were observed in this group.**



- Of 200 children ,
- 104 male children and 96 girl children were affected.
- In my study , both boys and girls are equally affected.
- 18 girl children had mortality (18 %) and 15 boy children had mortality (14%).



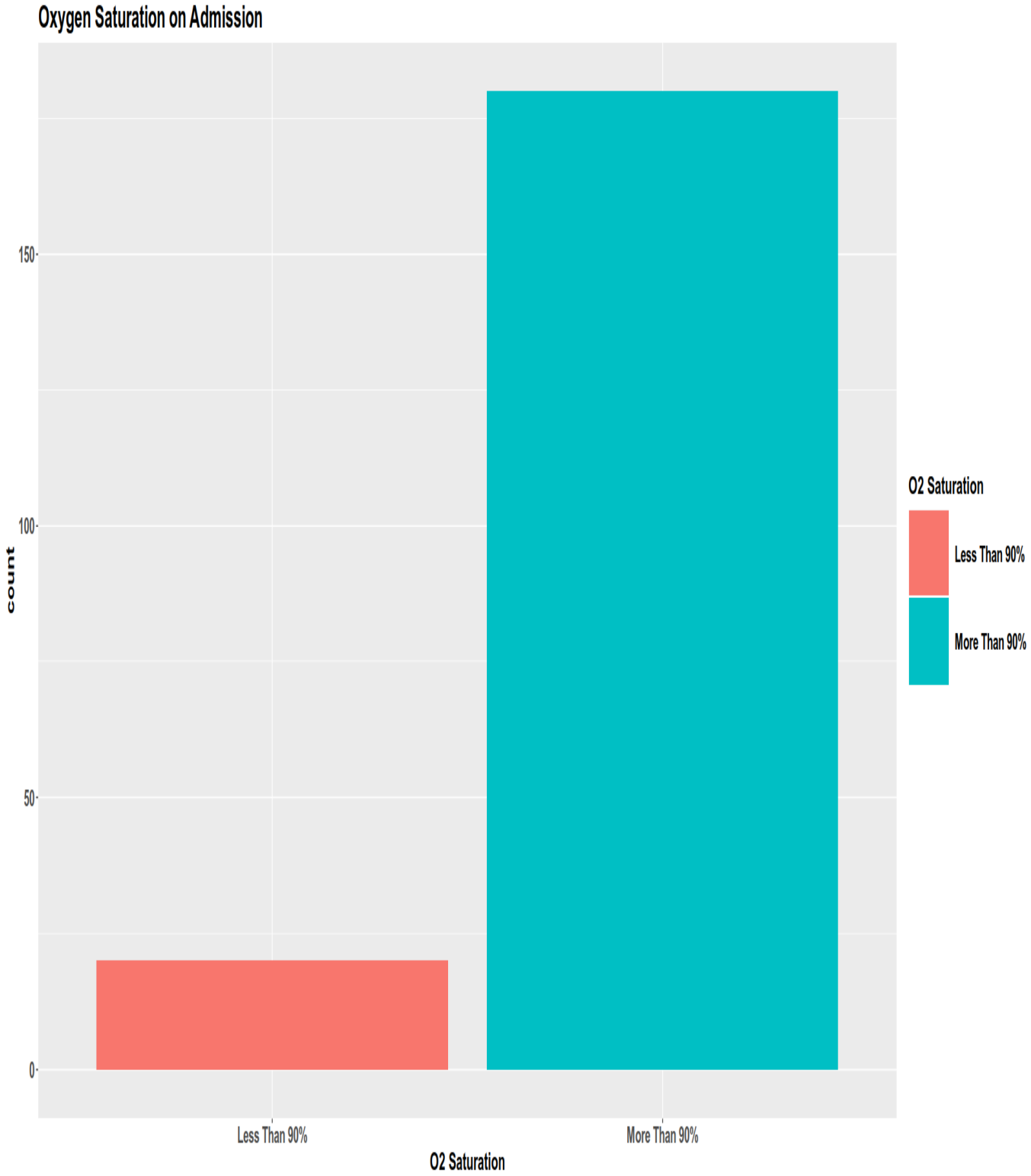
- Of 200 children ,
- 129 children with pneumonia had 1 co-morbidity. (64.5%)
- 70 children with pneumonia had 2 co-morbidity. (35%)
- 1 child with pneumonia had 3 mortality (0.5%)
- Most common comorbidity identified was malnutrition , lack of exclusive breast feeding , congenital heart disease .

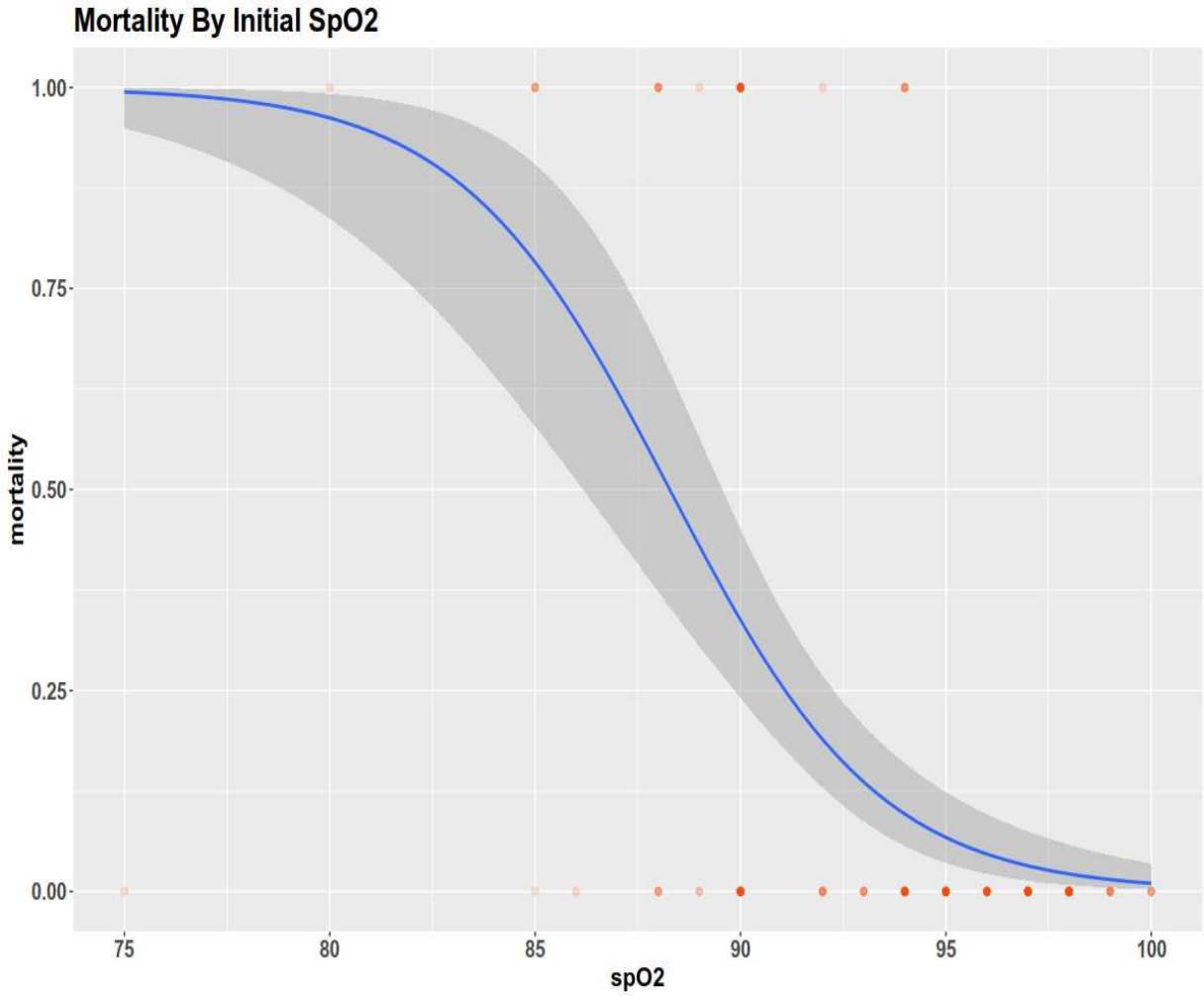


- Out of 200 children
- 80 children required assisted ventilation[49,50] **(40%)** .

- 33 children out of 80 children **(14%)** who succumb to death required invasive mode of ventilation for cardio-respiratory support.

- In a study conducted by Kohno et al ,
- 28 day mortality was **12.3 %.**
- Mechanical ventilation rate was **14.4%.** Mortality is 50 % among mechanical ventilation group.
- Incidence of ARDS was 10 %.
- The mortality of community acquired pneumonia is **10-25%.**
- In a study conducted by Ramachandran et al and European intensive society , **Need of assisted ventilation** is one of the independent mortality predictor in community acquired pneumonia.
- **In my study the need for assisted ventilation was 40 % .**
- **The need for mechanical ventilation was 14 %.**
- **The mortality due to community acquired pneumonia is 16.5%.**
- **The incidence of ARDS was 2.5%**

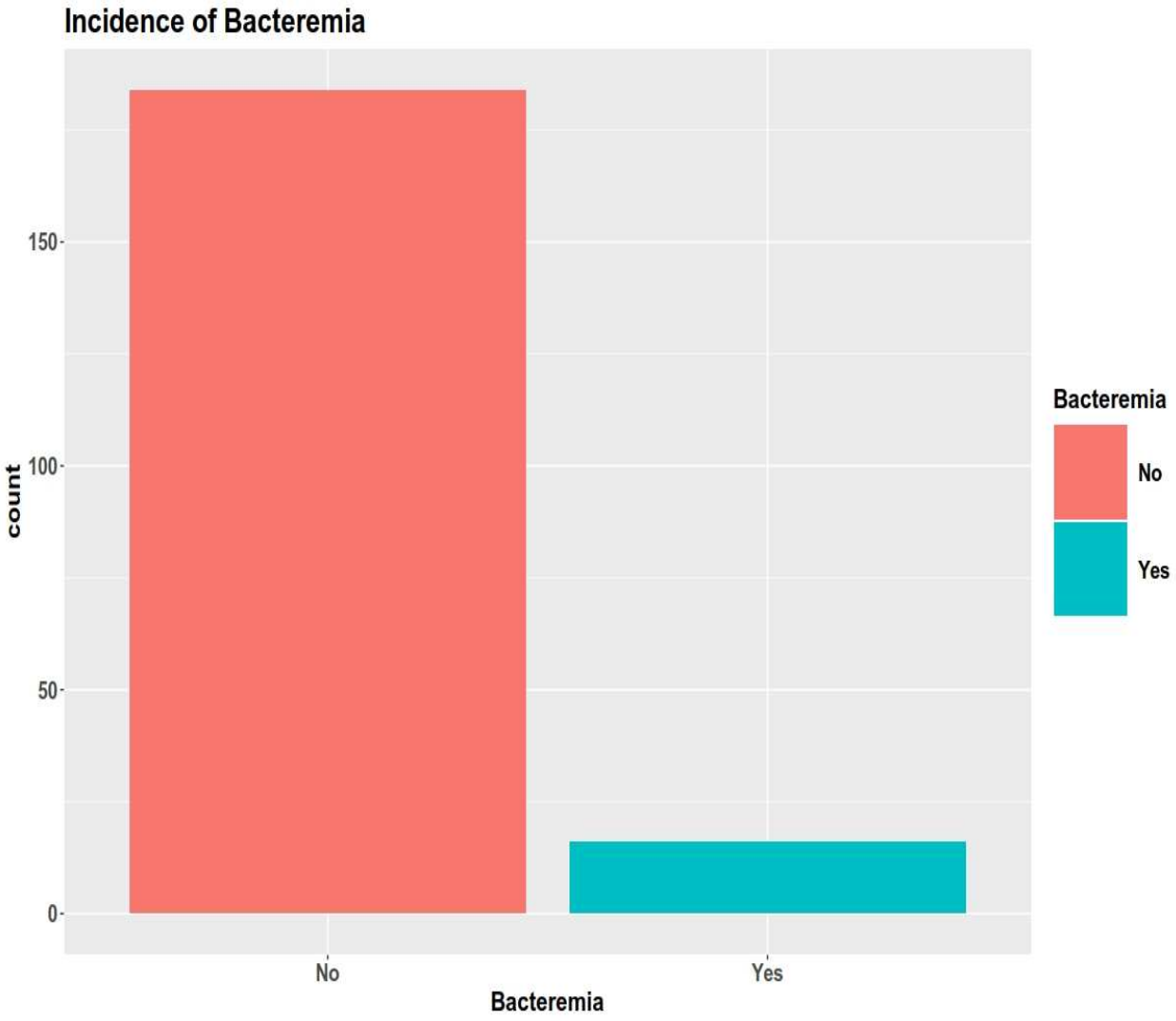

Oxygen Saturation on Admission
150
100
50
0
count
Less Than 90%
More Than 90%
O2 Saturation
O2 Saturation
Less Than 90%
More Than 90%



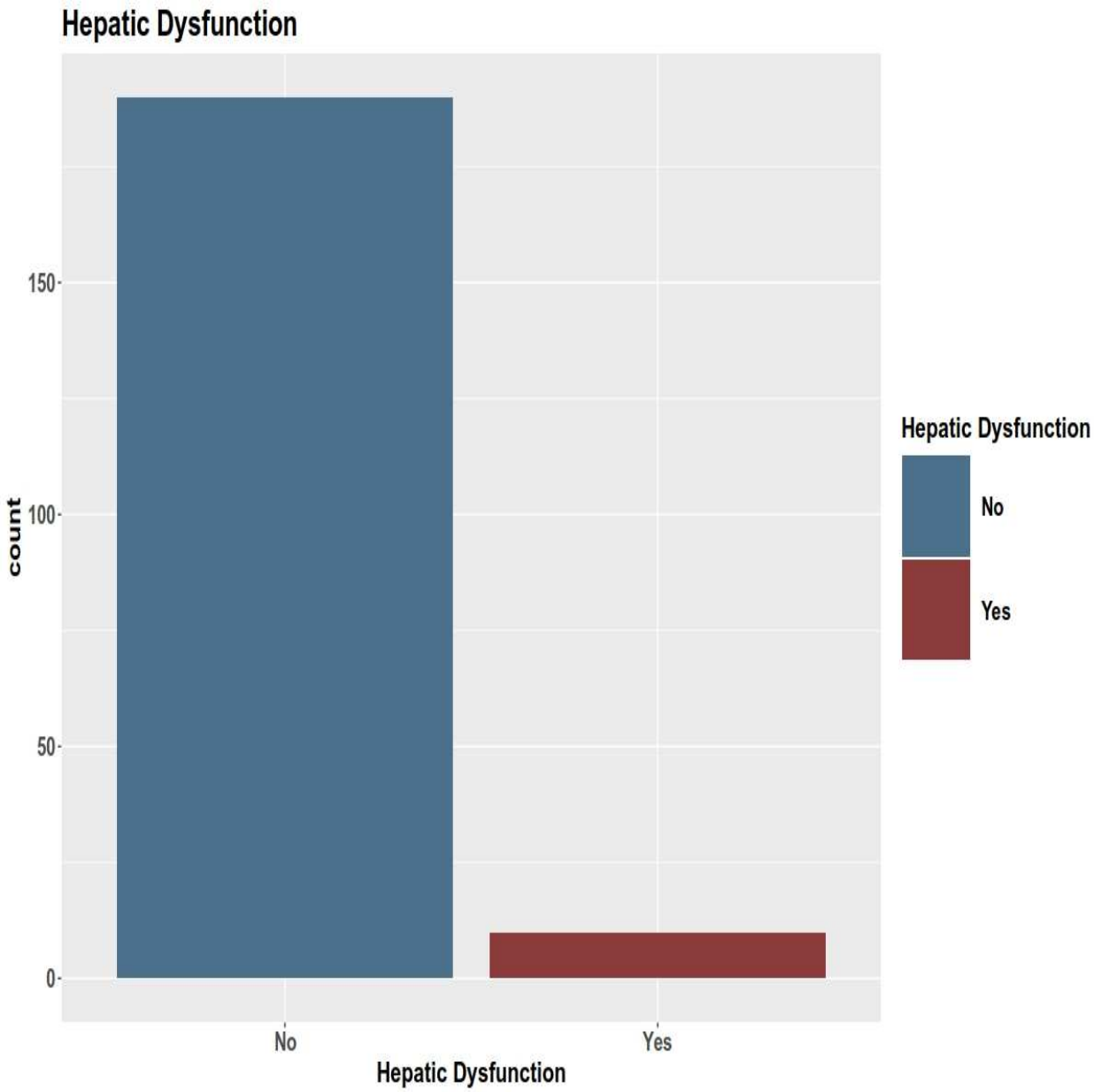
- The estimate of sPO2 is -0.39117 with **p value of less than 0.001**.
- Thus sPO2 when alone strongly predicts the mortality .
- An every unit increase in sPO2 the odds of survival increases by 33 percent.
- Hypoxemia is an single independent mortality predictor.

- Out of 200 children,
- 27 children had saturation of less than 90 (10%).
- **27 out of 33 (81%)** children with saturation **less than 90 %** had mortality.
- This implies hypoxemia as an independent predictor of mortality of pneumonia.

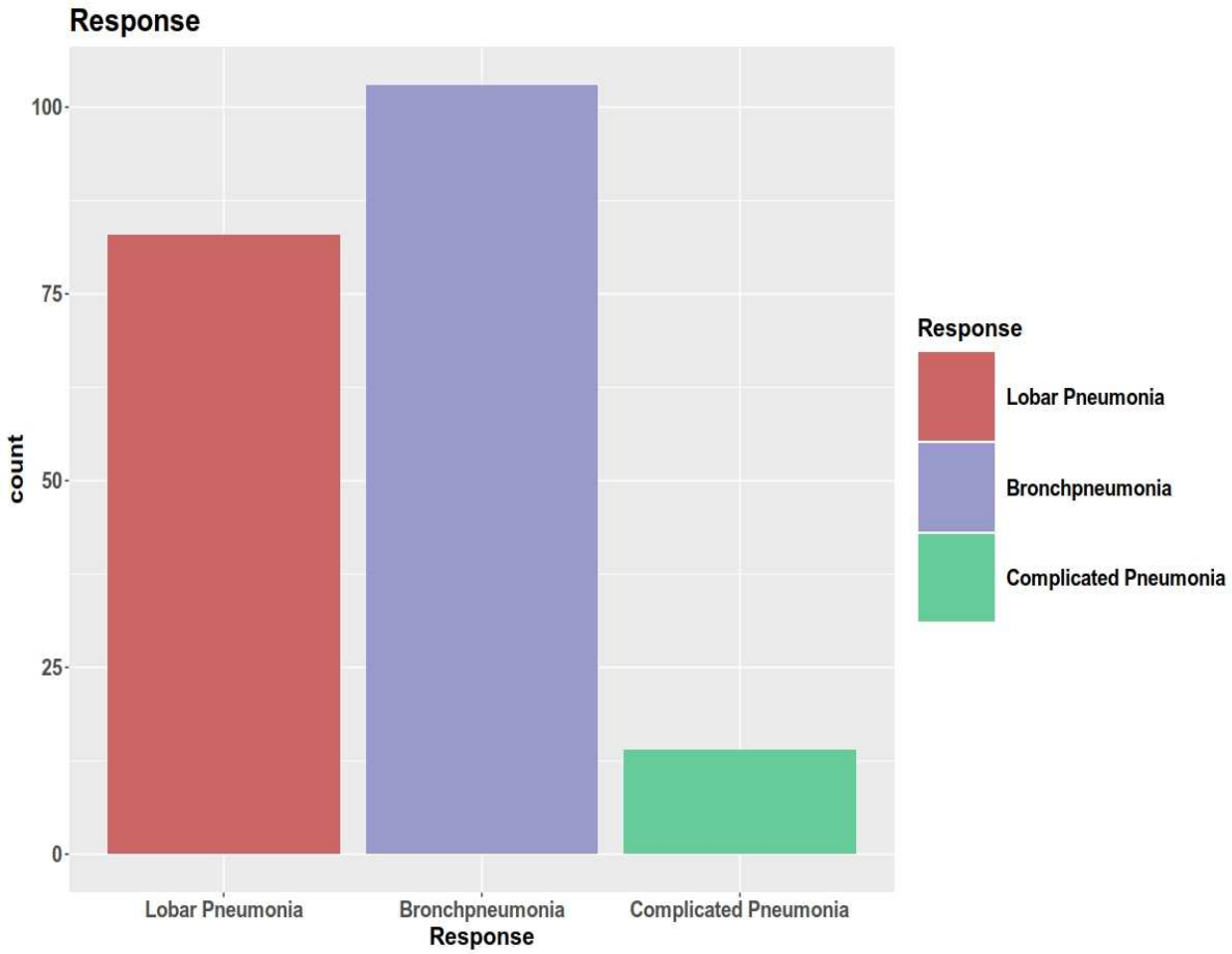
- In a study conducted by Basnet et al,
- **Hypoxemia** is an **independent risk facto**r of predicting mortality in children due to community acquired pneumonia.
- In a study conducted by Catia Cilloniz et al,
- **Baseline oxygen saturation** is an independent predictor for need of invasive mechanical ventilation.



- Out of 200 children ,
- 16 children had culture positive pneumonia (8%).
- In my study ,11 out of 16 children with culture positive pneumonia had mortality(70%).
- In a study conducted by Rello et al , Bacteremia was a independent prognostic factor for predicting mortality .


Hepatic Dysfunction
150
100
50
0
count
No
Yes
Hepatic Dysfunction
Hepatic Dysfunction
No
Yes

- Out of 200 children ,
- 10 cases of pneumonia had hepatic dysfunction (5%).
- 6 cases of pneumonia with hepatic dysfunction died (60%).
- In a study of Model for End Stage Liver disease and Pneumonia where four parameters were assessed which includes Bilirubin , INR , vasopressor , Pulse Oxygen Saturation/Fractional inspired oxygen.
- MELD-P having 78% sensitive and specific in predicting mortality .
- This implies pneumonia with liver failure have bad prognosis .

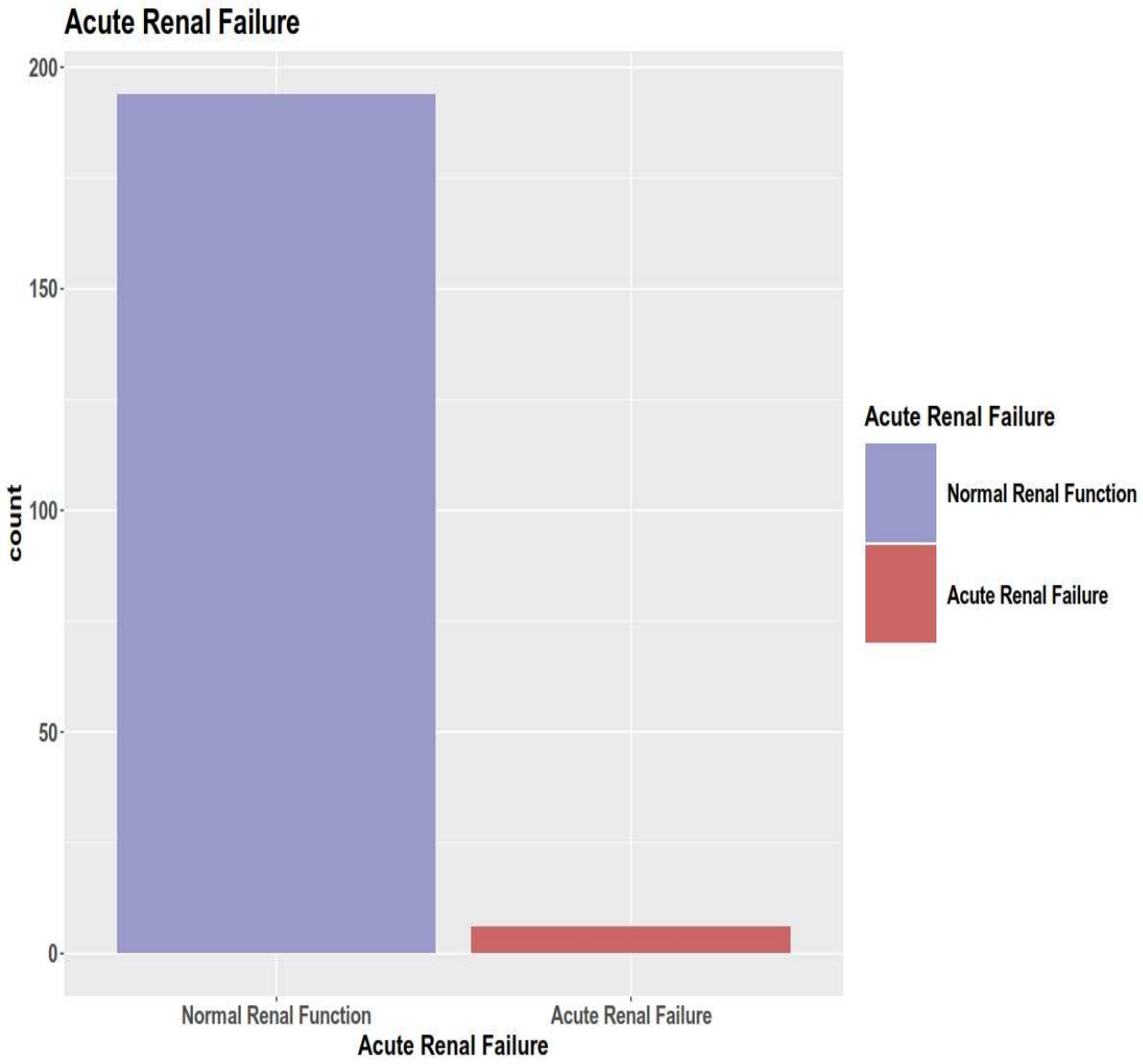


Out of 200 children with radiological confirmed pneumonia[44]

101 cases had bronchopneumonia (50.5%)

83 cases had lobar pneumonia (41.5%)

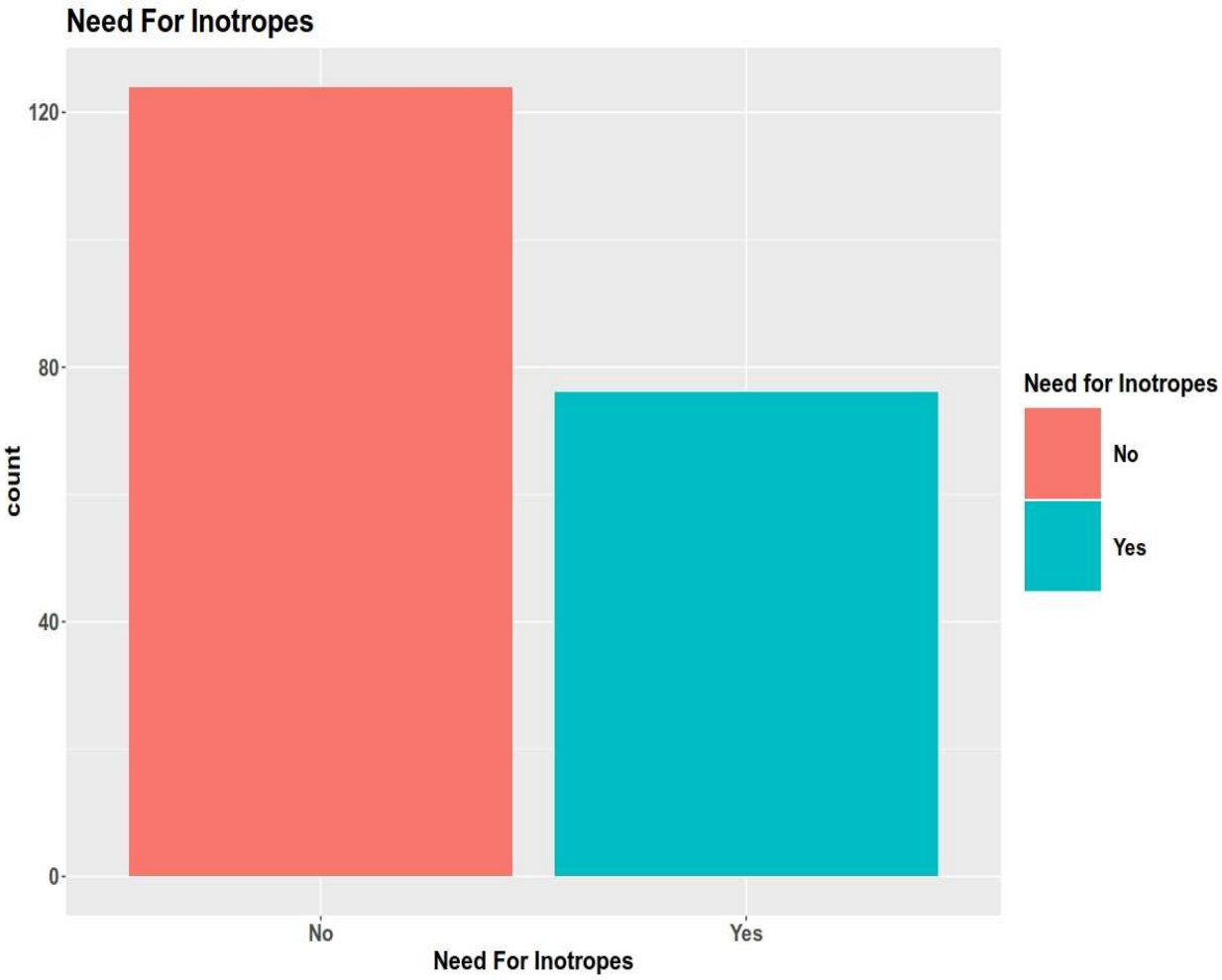
16 cases had complicated pneumonia (8%).



Out of 200 children ,

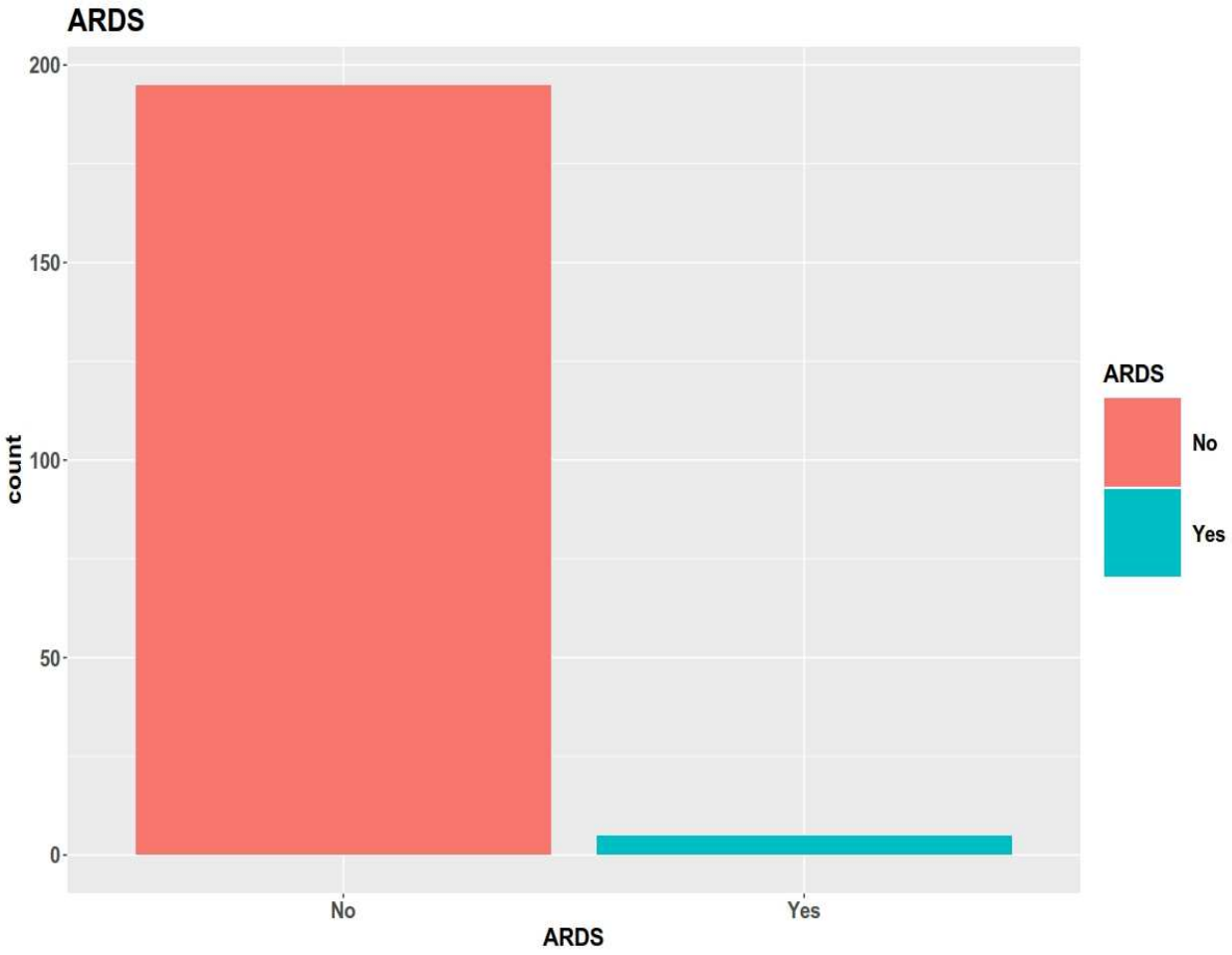
- Overall incidence of Acute Kidney Failure attributed to pneumonia was **3.5 %** in my study (7 out of 200 children).
- Out of which **85%** was succumb to death. (6 out of 7 children).

- Pneumonia with Acute Kidney Injury have poorer outcome than those without AKI.
- In a study conducted by epidemiological and outcome of Acute Kidney Injury ,
- Sepsis was the most common cause of Acute Kidney Injury (53%).
- Pneumonia contributed to 9.1% of mortality.
- Pneumonia with AKI had poorer outcome .

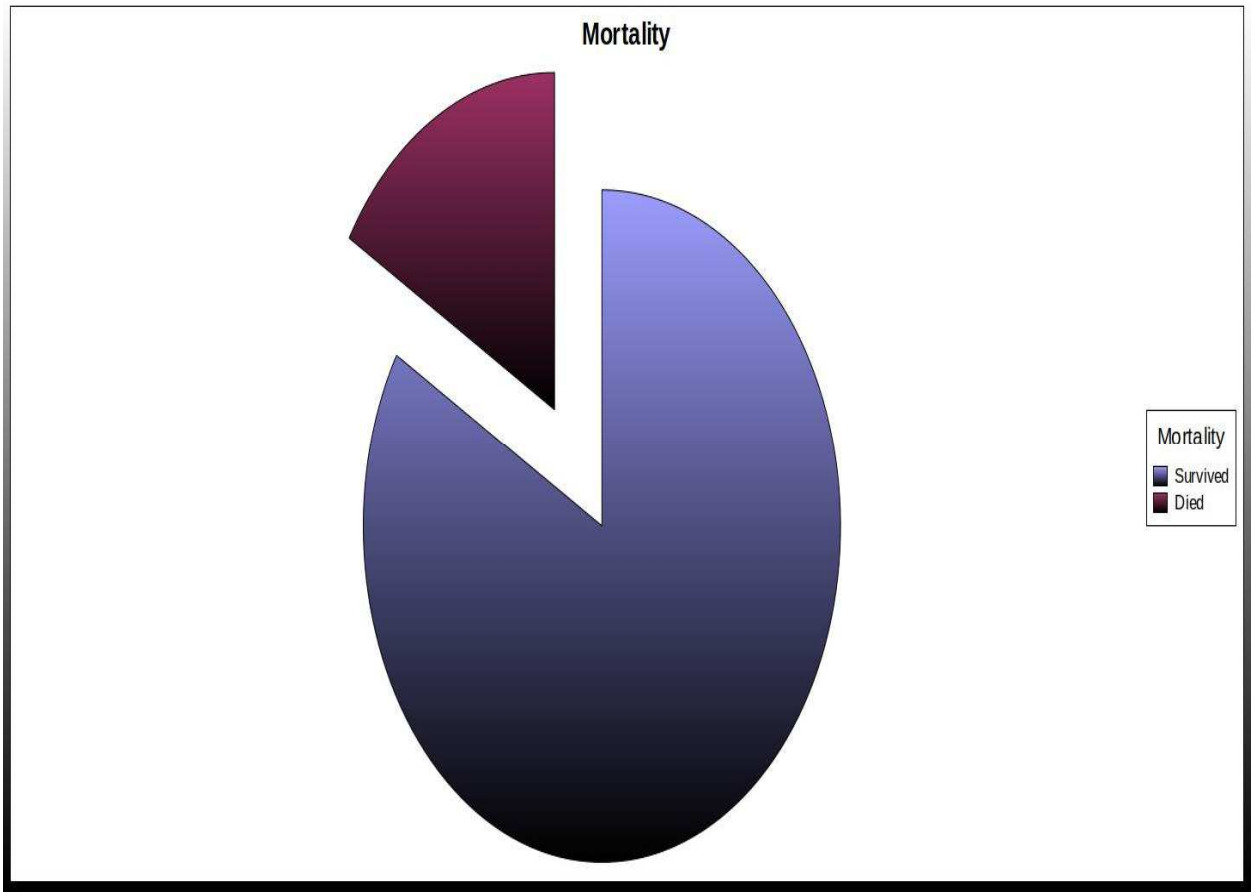


- Out of 200 children ,
- 76 children required inotrope for cardiac support (38%).
- In a study Amanda et al ,
- Pneumonia is the leading cause of use of inotropic support , followed by septicaemia .
- Vasoactive inotrope score at 48 hours was a strong independent predictor of primary outcomes and intubation .

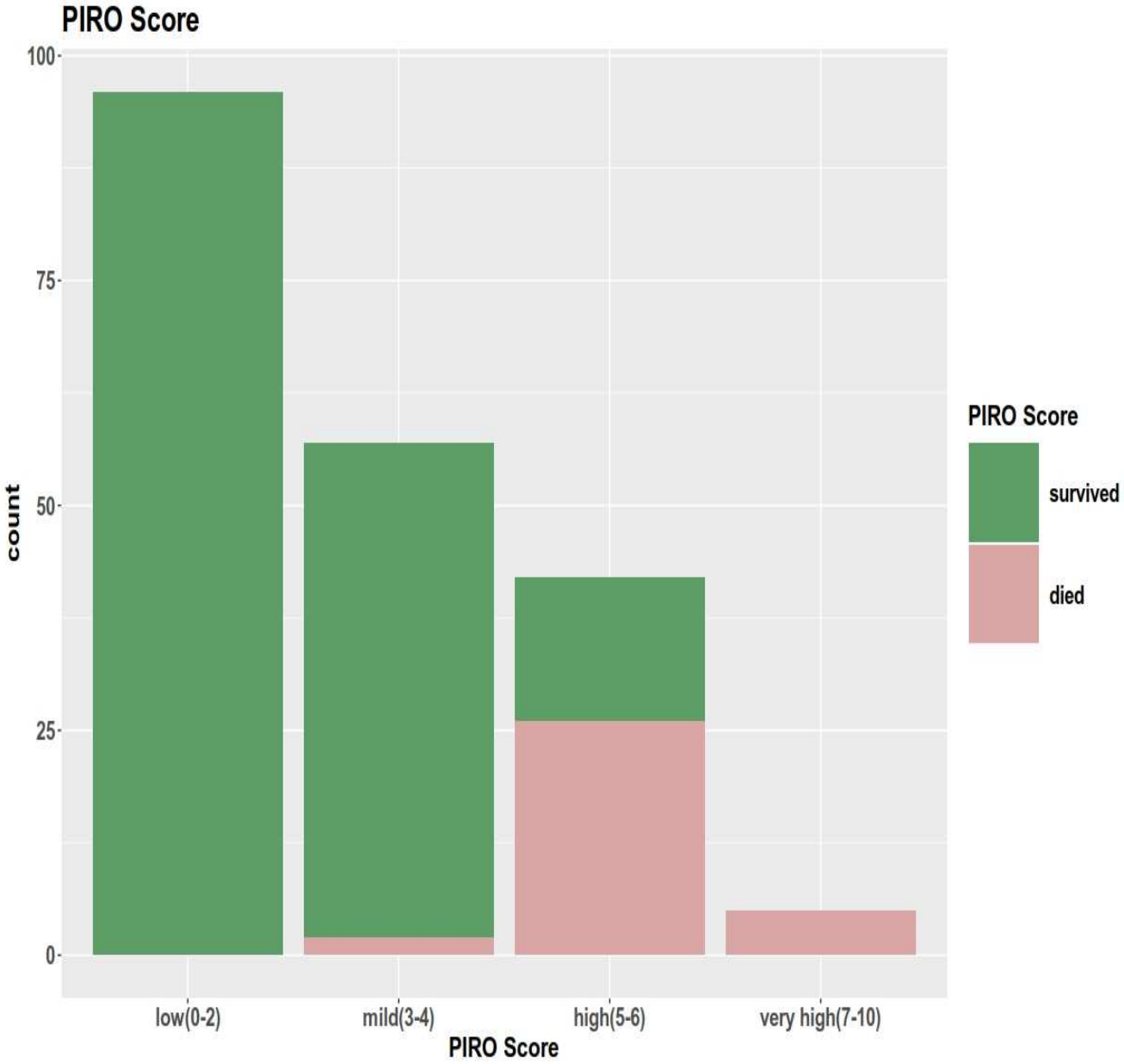
- For every unit increase in vasoactive inotropic score at 48 hours , there was a 3% increase in ICU length of stay and 8% increase in ventilator days .
- In my study ,
- 38 % (76/200) of children required inotropic support .
- 33 children with severe pneumonia required vasoactive inotrope support out of 76 children (43%) .



- Out of 200 children ,
- 5 children developed ARDS (2.5%).

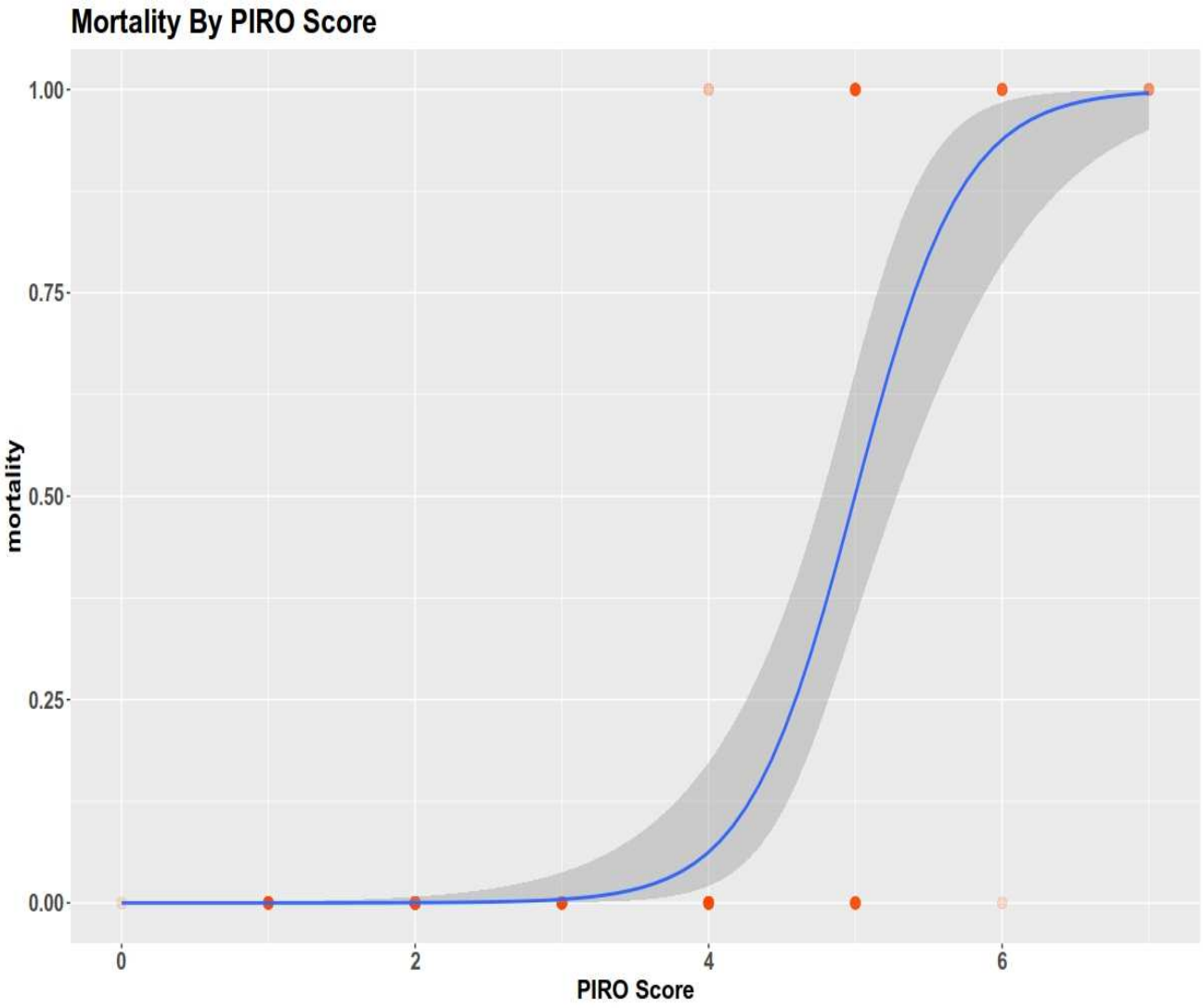


- Out of 200 children ,
- 33 children died of pneumonia (16.5%).

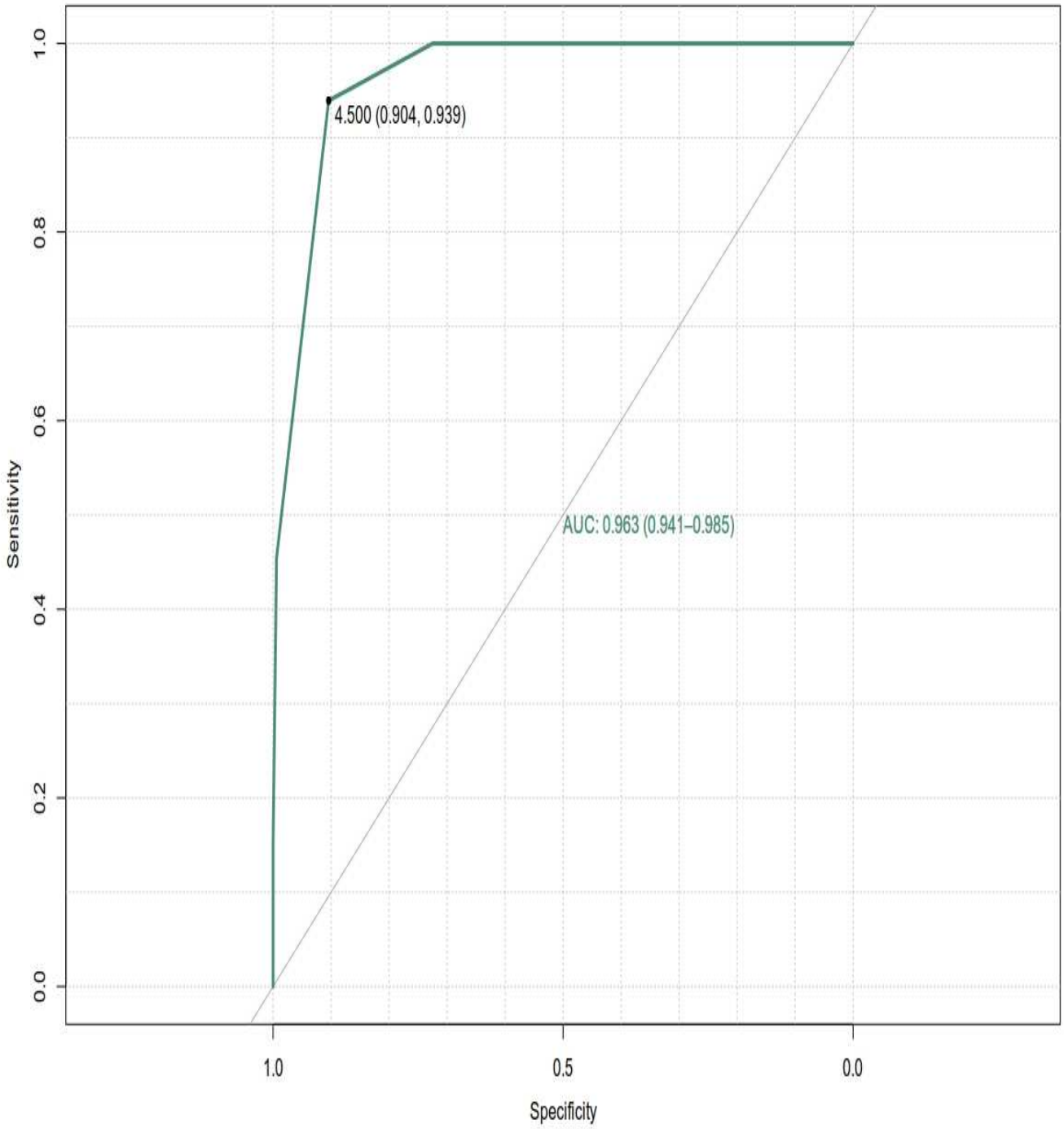

PIRO Score
100
75
50
25
0
count
low(0-2)
mild(3-4)
high(5-6)
very high(7-10)
PIRO Score
PIRO Score
survived
died

- Association between PIRO score and mortality prediction in my study:
- 200 Children were stratified into 4 groups:
- 0-2 (low score): 96 cases (48%).
- 3-4 (moderate score): 57 cases (28.5%).
- 5-6 (high score): 42 cases (21%).
- 7-10 (very high score): 5 cases (2.5%).

- **ASSOCIATION BETWEEN PIRO AND MORTALITY**:
- Score 0 -2: 0 mortality (**0%**)- (0/96).
- Score 3-4: 2 cases mortality (**3.5%**) – (2/57).
- Score 5-6: 27 cases mortality (**64%**)-(42/57).
- Score 7-10: 5 cases mortality (**100%**)-(5/5).
- **As score increases the mortality due to severe pneumonia increases**.



- PIRO score has P value of < 0.001. PIRO score when taken alone strongly predicts mortality .
- PIRO estimates of 2.7181 indicates that for every one unit increase in PIRO score odds of mortality increases by 15 fold.


Sensitivity
1.0
0.8
0.6
0.4
0.2
0.0
4.500 (0.904, 0.939)
AUC: 0.963 (0.941–0.985)
1.0
0.5
0.0
Specificity

- ROC curve was built for mortality with PIRO score . PIRO score is acting as a robust discriminator in predicting mortality which is evident by high Area Under Curve (AUC) of 0.963 with entire confidence interval (0.941-0.985) is well placed ahead of 0.5 mark.

- Best threshold for PIRO SCORE in trading between Sensitivity and Specificity was identified by Youden method .
- It was found to be 4.5.

- This concludes that any score above 4 (5 and above) is predicting mortality better.

- **SENSITIVITY OF PIRO SCORE IN PREDICTING MORTALITY : 93.9%**
- **SPECIFICITY OF PIRO SCORE IN PREDICTING MORTALITY : 90.4%**

- **DISCUSSION:**

- Pneumonia is the most common infectious disease requiring ICU admission worldwide.

- Early admission to intensive care and combination of antibiotics can reduce the mortality of pneumonia.

- Various mortality predictors like need for inotrope, need for assisted ventilation, acute renal failure, acute liver failure are independent mortality predictors of severe pneumonia.

- Pneumococcal pneumonia is the most common cause of pneumonia worldwide which can be prevented by pneumococcal conjugate 13 and pneumococcal polysaccharide vaccine PPV23.

- As infants were more prone for pneumonia, a multimodal approach is needed to manage these children as they have rapid deterioration course.

- PIRO is acting as a better predictor of mortality in my study as compared to various studies.

- Prevalence of hypoxemia in my study of 200 patients is 10% as compared to 38% in a review study.

- Prevalence of culture positive pneumonia was 8 % as compared to other literate which had culture positive of 10%.

- Prevalence of assisted ventilation which include invasive mechanical and non invasive ventilation was 40 % as compared to 41 % in other studies . This shows assisted ventilation is the independent risk factor for predicting mortality.

- Prevalence of renal failure is 3.5%. Out of which 6 cases died with ARF with pneumonia - 85% mortality.

- Prevalence of acute liver failure is 5 %. Out of which 6 cases died with acute liver failure with pneumonia – 60 % mortality.

- In my study ,
- 71 %Infants were more prone for pneumonia
- 64.5%of children had one co morbidity
- 40% of children required assisted ventilation
- 10 % of children had hypoxemia
- 8% of children had culture positive pneumonia

- 5 % of children with pneumonia had hepatic dysfunction
- 3.5% of children with pneumonia had renal failure
- 50.5% of children had radiological bronchopneumonia
- 41.5% of children had radiological lobar pneumonia
- 8% of children had radiological complicated pneumonia
- 38% of children required inotrope for cardiac support
- 2.5 %of children with pneumonia had ARDS

- **In a study conducted by Araya et al is**
- **Low score 0-2 : 0 % mortality (0/708 patients)**
- **Moderate score 3-4 :18% (20/112 patients)**
- **High score 5-6 : 83% (25/30 patients)**
- **Very high score 7-10:100% (10/10 patients)**

- **ASSOCIATION BETWEEN PIRO AND MORTALITY:**
- **In my study ,**
- **Score 0 -2: 0 mortality (0%)- (0/96).**
- **Score 3-4: 2 cases mortality (3.5%) – (2/57).**
- **Score 5-6: 27 cases mortality (64%)-(42/57).**
- **Score 7-10: 5 cases mortality (100%)-(5/5).**

LIMITATIONS

- Small sample size is adequate enough to correlate mortality.
- But large sample size may be needed to correlate individual variable to mortality.
- Mortality in our study was 16.5% , which may be due to tertiary health care centre where sicker referral cases were treated.
- Laboratory parameters (counts , CRP) were not taken into considerations.
- Clinical parameters were not taken into considerations.

CONCLUSION

- Of 200 study subjects, 3.5 % of mortality belongs to moderate score (3-4).
- **64%** of mortality belongs to high score (5-6).
- **100%** of mortality belongs to very high score (7-10).
- **Hypoxemia , Hepatic dysfunction , Acute Renal Failure , Assisted mode of Ventilation** are independent predictors of mortality in severe pneumonia.
- PIRO score has a **P value of 0.001** which is statistically significant in predicting mortality for children hospitalized with community acquired pneumonia.
- ROC curve was built for mortality with PIRO score . PIRO score is acting as a robust discriminator in predicting mortality which is evident by high Area Under Curve (AUC) of 0.963 with entire confidence interval (0.941-0.985) is well placed ahead of 0.5 mark.
- Best threshold for PIRO SCORE in trading between Sensitivity and Specificity was identified by Youden method .
- It was found to be 4.5.
- This concludes that any score above 4 (5 and above) will predict the mortality better.

- **SENSITIVITY OF PIRO SCORE IN PREDICTING MORTALITY : 93.9%**
- **SPECIFICITY OF PIRO SCORE IN PREDICTING MORTALITY : 90.4%**

- **Thus I conclude that PIRO SCORE can be used as a tool to predict mortality of children hospitalised with community acquired pneumonia in a tertiary care institute.**
- **Thus PIRO SCORE can be used as a tool to predict mortality and decision can be made on treatment strategies for intensive care admission and intensive management.**

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PROFORMA

NAME:

AGE:

SEX:

I.P No:

ADDRESS:

PATIENT PHONE NO:

COMPLAINTS:

1. Fever
2. Cough , cold , breathlessness
3. Fast breathing
4. Chest indrawing
5. Decreased urine output
6. Altered level of consciousness-lethargy , less active than usual, incessant cry, excessive sleepiness
7. Seizures
8. Bluish discolouration of limbs
9. Ear discharge
10. Skin infection
11. Recent exanthematous fever

SOCIO ECONOMIC HISTORY: 1. Overcrowding
2.indoor air pollution

EXAMINATION:

GENERAL EXAMINATION:

Conscious-

Pallor -

icterus-

Cyanosis-

Clubbing-

Pedal oedema-

Lymphadenopathy-

Vital signs:

PR-rhythm , volume , character , radio radial / radio femoral delay

RR- tachypnoea is defined as RR more than or equal to 60/min in 2 months of age , 50 or more in 2 months to 1 yr of age , 40 or more in 1 to 5 yrs of age.

BP-

spO2-

temperature

Anthropometry:

Height in cm-

Weight in kg-

Weight for age-

Weight for height-

Mid arm circumference-

SYSTEMIC EXAMINATION

CVS-

RS-

ABDOMEN-

CNS-

DIAGNOSIS:

INVESTIGATIONS:

1.Complete hemogram:

HB%- TC-

DLC- PLT-

2.CRP

3.Blood culture & sensitivity

4.Urine culture & sensitivity

5.RFT,LFT

6.Chest X-ray

7.ABG

PARTICIPANT INFORMATION SHEET

Study place: I.C.H, Egmore, Chennai-8.

Title of the study

APPLICATION OF A PROGNOSTIC SCALE TO PREDICT THE MORTALITY OF CHILDREN HOSPITALIZED WITH COMMUNITY ACQUIRED PNEUMONIA IN A TERTIARY CARE HOSPITAL

Name of the investigator: DR.K.karthik

Name of the Participant: **Age**: **Sex**:

Hospital number:

1. I have read and understood the patient information sheet provided to me regarding the participation of my child in the study.

2. I have been explained about the nature of the study and had my questions answered to my satisfaction.

3. I have been explained about my rights and responsibilities by the investigator.

4. I will allow my child to cooperate with the investigator and undergo clinical tests subjected during the study whole heartedly.

5. I have been advised about the risks associated with my child's participation in this study.*

6. I am aware of the fact that I can opt out of the study at any time without having to give any reason and this will not affect my child's future treatment in this hospital. *

7. I hereby give permission to the investigators to release the information obtained from my child as result of participation in this study to medical journals/conference proceedings.

8. I understand that my child's identity will be kept confidential if my child's data are publicly presented/published.

9. I have decided my child can participate in the research study. I am aware that if I have any question during this study, I should contact the investigator.

10. By signing this consent form I attest that the information given in this document has been clearly explained to me and understood by me, I will be given a copy of this consent document.

Name and signature / thumb impression of the parent/guardian

Name _____ Signature_____

Date_____

Name and Signature of the investigator

Name _____ Signature_____

Date_____

Name and Signature of impartial witness 1:

Name _____ Signature_____

Date_____

Name and Signature of impartial witness 2:

Name _____ Signature_____
Date_____

தகவல் படிவம்

ஆய்விடம்: அரசு குழந்தைகள் நல மருத்துவமனை மற்றும் ஆராய்ச்சி

நிலையம், எழும்பூர்,சென்னை-

முதன்மை ஆராய்ச்சியாளர்:மருத்துவர்.

பங்கு பெறுபவரின் பெயர்: வயது: பாலினம்:

மருத்துவமனை எண்:

ஆய்வின் நோக்கம்:

நிமோனியா இறப்புக்கு முன்கணிப்பு அளவை பயன்படுத்துதல்

ஆய்வின் செய்முறை:

இப்பரிசோதனையில் ஈடுபடுத்தப்படும் குழந்தையின் முழு விவரங்கள், நோய் வரலாறு, மற்றும் அதற்குண்டான மருத்துவரின்சோதனை விவரங்கள, இச்சோதனைக்கென தனியாக ஒதுக்கப்பட்ட படிவத்தில் பதியப்படும்.

அதன் தொடர்ச்சியாக,அக்குழந்தைகளுக்கு எழும்பூர் அரசு குழந்தைகள்நல மருத்துவமனைக்கென உண்டாக்கப்பட்ட வைத்திய விதிமுறைப்படி குருதி மாதிரிகள் மற்றும் ஊடுகதிர் படம்,கணினிவழி உடலுறுப்பு ஊடுகதிர்படம் ஆகியவை மேற்கொள்ளப்படும்.

பிறகு பரிசோதனையில் ஈடுபடுத்தப்படும் குழந்தைகள் மருத்துவமனையில் தங்கியிருக்கும் காலம் வரை

தொடர்ச்சியாக கண்காணிப்பில் வைக்கப்படும். நோயின் தொடர்ச்சியாக ஏற்படும் விளைவுகளைக் கண்டறிய, மருத்துவமனையிலிருந்து வெளியேறும் போது மருத்துவ பரிசோதனை மேற்கொள்ளப்படும்.

ஆய்வில் பங்கேற்க மறுத்தல்:

இந்த ஆய்வில் பங்ககேற்பது முற்றிலும் உங்களது சொந்த விருப்பமே. தாங்கள் இந்த ஆராய்ச்சியில் இருந்து எப்போதுவேண்டுமானாலும் விலகிக்கொள்ளலாம். அவ்வாறு இந்த ஆராய்ச்சியில் இருந்து விலகிக்கொள்வதால் உங்கள் குழந்தை பெறும் மருத்துவ சிகிச்சையில் எந்த மாற்றமும் இருக்காது.

பங்கேற்பதின்இலாபநஷ்டங்கள்:**இந்தஆய்வில்பங்கேற்பதால் உங்கள் குழந்தைக்கு எந்த நேரடி மருத்துவ பலனும் கிடையாது.ஆனால் இந்த** ஆராய்ச்சியிலிருந்து பெறப்படும் தகவல்கள், வருங்காலத்தில் இது போன்ற**குழந்தைகளின்**

சிகிச்சைக்கு பலன் அளிக்கலாம்(உங்கள் குழந்தை உள்பட). இந்த மறைமுக இலாபமும், இவ்வாறு மருத்துவ வளர்ச்சியில் பங்குபெற்ற பெருமையும் உங்களை சேரும். **ஆய்வின் முடிவுகள் ஆய்வு நடக்கும்போதோ(தேவைஏற்படின்) அல்லது ஆய்வு முடிந்த பின்னரோதங்களுக்கு தெரிவிக்கப்படும்.**

இரகசியத்தன்மை:

இந்த ஆராய்ச்சியில் ஈடுபடும் உங்கள் குழந்தையின் அனைத்து தகவல்களும் இவ்வாராய்ச்சிக்காக மட்டுமே பயன்படுத்தப்படும். இந்தரகசியங்கள் உங்கள் சம்மதம் இல்லாமல் வெளியிடப்படமாட்டாது, ரகசியங்கள் பாதுகாக்கப்படும்.

பங்கேற்பவர்உரிமை:

தங்கள் குழந்தை பற்றிய விவரம் தெரிய ஆய்வு மருத்துவரை அணுகலாம்.

ஆய்வாளரின்பெயர் :மருத்துவர். குகார்த்திக்.

கைப்பேசிஎண்: 9597675433

முகவரி : முதுநிலைபட்டமேற்படிப்புமாணவர்

அரசுகுழந்தைகள்நலஆராய்ச்சிநிலையம்மற்றும்குழந்தைநலமருத்துவமனை , எழும்பூர் , சென்னை-8.

ஆய்வாளரின் கையொப்பம் **பெற்றோரின் கையொப்பம்**

நாள்

இடம்

ஒப்புதல்படிவம்

ஆய்விடம் : அரசு குழந்தைகள் நல மருத்துவமனை மற்றும் ஆராய்ச்சி நிலையம், எழும்பூர் , சென்னை-8

ஆய்வாளர் : மருத்துவர் . குகார்த்திக்.

பங்குபெறுபவரின் பெயர் : **வயது :** **பாலினம் :**

மருத்துவமனை எண் :

<u>ஆய்வுதலைப்பு</u>: நிமோனியா இறப்புக்கு முன்கணிப்பு அளவை பயன்படுத்துதல்

1) **எனக்கு தரப்பட்ட ஆராய்ச்சியில் பங்குபெறுவோர்க்கான தகவல் படிவத்தை முழுமையாக படித்து புரிந்துகொண்டேன்**.
2) **ஆராய்ச்சியின் தன்மை முழுமையாகவும் விரிவாகவும் எடுத்துரைக்கப்பட்டது**.
3) **எனது எல்லாகேள்விகளுக்கும் விடையளிக்கப்பட்டது**.
4) **ஆய்வாளர் என் உரிமைகளையும் , பொறுப்புகளையும் நன்கு விளக்கினார்**
5) **நான் , என்குழந்தை , ஆய்வாளருக்கு முழு ஒத்துழைப்புகொடுக்கவும் , பரிசோதனை செய்து கொள்ளவும் அனுமதிக்கிறேன்**.
6) **என் குழந்தைக்கு இரத்த பரிசோதனை , ஊடுகதிர்படம் , கணினி வழி ஊடுகதிர்படம் மற்றும் தேவைக்கான பரிசோதனைகள் செய்துக்கொள்ள முழுமனதுடன் சம்மதம் தெரிவிக்கிறேன்**.
7) **எனது குழந்தை ஆராய்ச்சியில் பங்கேற்பதால் ஏற்படும் சாதகபாதகங்களை ஆய்வாளர் விளக்கிக்கூற அறிந்துகொண்டேன்**
8) **எப்பொழுது வேண்டுமானாலும் என் குழந்தையை இந்த ஆய்வில் இருந்து விலக்கிகொள்ளலாம் என்பதை அறிவேன் . அவ்வாறு விளக்கிக்கொள்வதால் குழந்தைக்கு கொடுக்கப்படும் சிகிச்சையில் எந்த மாற்றமும் இருக்காது என அறிந்துகொண்டேன்**

9) **இந்த ஆய்வுக்காக பெறப்படும் என் குழந்தையின் தகவல்களை ஆய்விதழ்களிலேயோ , கருத்தரங்கிலேயோ வெளியிடுவதில் எனக்கு எந்தவித மறுப்போ , ஆட்சேபணையோ இல்லை .**

10) **என் குழந்தையின் தன் அடையாளங்கள் ஆய்விதழ்களிலேயோ, கருத்தரங்கிலேயோ வெளியிடப்படமாட்டாது என எனக்கு உறுதியளிக்கப்பட்டது .**

11) **எனக்கு இந்த ஆராய்ச்சிகுறித்தனசந்தேகம் இருந்தால் உடனே ஆய்வாளரை கேட்டு தெளிவுபடுத்திகொள்ளலாம் என உறுதியளிக்கப்பட்டது**

12) **இந்த ஒப்புதல் படிவத்தில் கையொப்பமிடுவதின் மூலம் இந்த படிவத்தில் உள்ளவையாவும் எனக்கு தெளிவாக எடுத்துரைக்கப்பட்டது , அதை நான் நன்கு புரிந்துகொண்டேன் என தெரிவித்துக்கொள்கிறேன்.**

நோயாளியின்பெற்றோர் / பாதுகாவலர்

பெயர் கையொப்பம்/பெருவிரல்சுவடு தேதி

ஆராய்ச்சியாளர்

பெயர் கையொப்பம்/பெருவிரல்சுவடு தேதி

சாட்சி 1

பெயர் கையொப்பம்/பெருவிரல்சுவடு தேதி

சாட்சி 2

பெயர் **கையொப்பம்/பெருவிரல்சுவடு** **தேதி**

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