Dissertation on

"A COMPARATIVE STUDY OF THE PROGNOSTIC SIGNIFICANCE OF CURB 65 AND EXPANDED CURB 65 IN COMMUNITY ACQUIRED PNEUMONIA PATIENTS"

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CHENNAI-600010

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LIST OF ABBREVIATIONS USED

(In alphabetical order)

ATS	:	American Thoracic Society.
BTS	:	British Thoracic Society
CAP	:	Community Acquired Pneumonia
CCrRB65	:	Confusion, Creatinine, Respiratory Rate; Blood Pressure; age >65years
CI	:	Confidence Interval
COPD	:	Chronic obstructive pulmonary disease
CRB65	:	Confusion, Respiratory Rate; Blood Pressure, age >65years
CURB 65	:	Confusion; Blood Urea nitrogen; Respiratory Rate; Blood Pressure; age >65years
CXR	:	Chest radiograph
ED	:	Emergency Department
FiO2	:	Fraction of inspired oxygen
HIV	:	Human Immunodeficiency Virus
HTN	:	Hypertension
ICU	:	Intensive care unit
IDSA	:	Infectious Disease Society Of America
IgA	:	Immunoglobulin A
ITU	:	Intensive therapy unit

OR	:	Odds Ratio
PaO2	:	Partial pressure of Oxygen
PIRO	:	Predisposition, Insult, Response, and Organ dysfunction
PORT	:	Pneumonia Patient Outcomes Research Team
PSI	:	Pneumonia severity Index
RR	:	Respiratory Rate
T2DM	:	Type 2 Diabetes mellitus

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CONTENTS

Abstract

The aim of this study is to compare the prognostic significance of CURB 65 and Expanded CURB 65 in community acquired pneumonia patients. These are simple tests which can be done on day 1 of admission and have profound value in identifying the at risk individuals.

Objectives

To assess the length of stay in hospital in CAP patients and their CURB 65 and expanded CURB 65 score at admission

2) To assess the need for intensive medical care admission in CAP patients and their CURB 65 and expanded CURB 65 score at admission

3) To assess the in hospital mortality rate in CAP patients and their CURB 65 and expanded CURB 65 score at admission

Results :

In this study it was found that both scores predicted the length of hospital stay,need for intensive care, need for mechanical ventilation with equal significance. However Expanded curb score is sensitive in predicting the mortality better than curb 65.Further serum albumin on day 1 of admission is a better predictor of longer duration of stay and intensive care.

Conclusion:

In a resource limited setting, CURB 65 is not inferior to expanded curb 65 in identifying at risk patients and serum albumin better predicts mortality.

INTRODUCTION

INTRODUCTION

In the entire world, community-acquired pneumonia continues to be one of the most significant public health issues.The name given to consumption by John Bunyan during the 20th century was "Captain of the Men of Death."In the US, there are more than five million instances of community-acquired pneumonia each year.Currently, it ranks as the ninth most common cause of death in the US.To yet, no legitimate field studies have been carried out in India to produce quantifiable data on the epidemiology of community-acquired pneumonia.

Typically, 80% of the affected patients receive outpatient care, while 20% receive inpatient care. The mortality rate for hospitalized patients can range from 12 to 40 percent, although it is less than 5 percent for outpatient treatments. The extremes have the highest incidence rates. According to estimates, community acquired pneumonia (CAP) costs the United States $17 billion annually. The incidence rate is 12–18/1000 for children under the age of 4 and 20/1000 for people over the age of 60.

Lower respiratory tract infection symptoms within a week, systemic symptoms like fever (>37.70 C), chills, rigidity, and malaise, clinical indicators like bronchial breathing and lung crepitation, and infiltrates in the chest on an X-ray are the criteria for diagnosis.

Community-acquired pneumonia is also defined by radiological characteristics such as

lobar or patchy consolidation, loss of cardiac, mediastinal, or diaphragmatic silhouette, interstitial infiltrates, or hilar and perihilar opacities (excluding pulmonary edema).

The severity of pneumonia can be measured using a variety of scores. The original grading system, the Pneumonia Severity Index (PSI), developed by the American Thoracic Society and the Infectious Disease Society of America, has 20 clinical and laboratory characteristics (IDSA). This scoring system's calculation is time-consuming despite having a strong discriminatory power for allocating the proper risk class. Later, the British Thoracic Society recommended a criteria for evaluating patients with Community Acquired Pneumonia that included disorientation, urea, respiratory rate, blood pressure, and age >65 (curb-65 score).

Other ratings, such as SMART-COP and A-DROP, were created to aid in deciding if a patient needs to be admitted to the hospital or even the intensive care unit.The time has come for a more straightforward and dependable scoring system.

Numerous studies have discovered that the biomarkers can differentiate between bacterial and viral pathologies and may provide further information on the severity of patients with community-acquired pneumonia. However, the majority of biomarkers are pricy and difficult to obtain in urgent situations.

The existence of underlying inflammation is one of numerous factors that affect albumin, an acute phase reactant. In cases of acid-base problems, albumin serves as a buffer and possesses anti-oxidant properties. Additionally, it regulates osmotic pressure, distributes hormones, and inhibits apoptosis. It has been demonstrated that inflammation lowers albumin levels regardless of the patient's dietary status. Hypoalbuminemia is linked to problems and a longer hospital stay. An indirect biomarker that aids in determining the severity of community-acquired pneumonia is serum albumin.

AIM OF STUDY

AIM OF THE STUDY

The aim of the study is to compare the prognostic significance of CURB 65 and expanded CURB 65 in community acquired pneumonia patients

PRIMARY OBJECTIVES

1) To assess the length of stay in hospital in CAP patients and their CURB 65 and expanded CURB 65 score at admission

2) To assess the need for intensive medical care admission in CAP patients and their CURB 65 and expanded CURB 65 score at admission

3) To assess the in hospital mortality rate in CAP patients and their CURB 65 and expanded CURB 65 score at admission

SECONDARY OBJECTIVE

1) To correlate the serum LDH levels ,serum albumin levels and platelet levels with curb 65 and expanded curb 65 scoring

REVIEW OF LITERATURE

REVIEW OF LITERATURE

An infection of the pulmonary parenchyma is known as pneumonia. Despite the fact that the prevalence of community-acquired pneumonia ranges from 5.16 to 6.11 per 1000 cases per year (7), it is frequently underestimated, misdiagnosed, and treated incorrectly. Acute fever, short, quick breathing, an elevated heart rate, a cough, and a chest discomfort that sticks were some of Maimonides' descriptions of the symptoms of pneumonia. Laennec outlined the three stages of consolidation and their associated clinical symptoms in 1834. Crepitus rattle, bronchial breathing during the red hepatization phase, and the return of crepitations (also known as "rhonchus crepitus redux") were used to describe the stages of congestion and resolution, respectively.

Streptococcus pneumonia and Klebsiella pneumonia were the two bacterial causes of pneumonia that Carl Friedlander and Albert Frankel identified in 1882. The founder of modern medicine, Sir William Osler, discussed the connection between pneumonia and advanced age as well as its mortality and morbidity. In a 1976 respiratory illness outbreak in Philadelphia, Legionella was shown to be the cause of pneumonia.
Both sporadic and pandemic occurrences of chlamydia pneumonia were discovered to be the cause. Pathogens that are multi-drug resistant are now more common in Hospital-acquired pneumonia than they were a few decades ago. 5 According to statistics, pneumonia is the eighth most prevalent cause of death in the US (8,9), with a

fatality rate of 1% in outpatient settings and close to 45%–60% in hospitalized patients.

The prevalence of pneumonia is observed to be higher in elderly people, adding to the disease's burden in the neighborhood. Lowering the disease's mortality requires earlier identification of risk factors, appropriate therapy, and management of high-risk patients in the intensive care unit.

ANATOMY

The upper respiratory passageways, the trachea, the bronchi, the bronchioles, and the right and left lungs with their countless blood arteries are the primary components or elements of the respiratory system, working their way downward from above.

- One of the significant landmarks is Ludwig's angle.

- second is the seventh cervical vertebra's spine

LUNG FISSURES

A line drawn from the second dorsal vertebra's spine, downward and outward along the fifth rib as it departs the vertebral column, to the sixth costochondral junction in front, indicates the primary fissure on either side.

Draw a horizontal line from the sternum at the level of the fourth costal cartilage to represent the horizontal fissure or transverse fissure.

PLEURAL SACS

The visceral component of the pleural membrane covers the surface of the lung and is redirected there at the hilum. The limits of the pleural sac reach the 8th, 10th, and 12th ribs in the midclavicular, midaxillary, and scapular lines, respectively, at a lower level in the chest.

LUNGS

One to one and a half inches above the collarbone is where the apices of the lungs are located. The midclavicular, midaxillary, and scapular lines in the sixth, eighth, and tenth ribs, respectively, are where the lower level of lungs are located.

SEGMENTAL ANATOMY

The topographical units of the lung, or bronchopulmonary segments, are crucial for both radiologists and surgeons.

A wedge-shaped piece of lung tissue known as a bronchopulmonary segment is nourished by a single bronchus and the accompanying pulmonary artery and vein. Practically speaking, each segment functions as a distinct entity with just minimal bronchial connection with neighbouring segments.

There is a thin film of fibrous tissue between the segments.

The pulmonary divisions of the lobar bronchi provide the specified pulmonary segments with air.

Right upper lobe bronchus

Apical

Posterior

Anterior

Right middle bronchus

Lateral

Medial

Right lower lobe bronchus

Apical

Medial basal

Anterior basal

Lateral basal

Posterior basal

Left upper lobe bronchus

Apicoposterior

Anterior

LINGULA

Superior

Inferior

Left lower lobe bronchus

Apical

Antero medial basal

Lateral basal

Posterior basal

PULMONARY DEFENCE MECHANISMS

Three factors are responsible for the defence of the lungs

1) MECHANICAL FACTORS
2) LOCAL HUMORAL SECRETIONS
3) CELLULAR ACTIVITY

Mechanical factors

Particles of all sizes are trapped in the tortuous nasal airways, and gravity ensures that particles larger than 5 to 7 microns in diameter fall into the oropharynx. Small particles enter the lungs and settle there based on their size and shape. By adhering to mucus and being pushed upward by ciliary action, particles that have so settled are eliminated.

LOCAL HUMORAL SECRETIONS

a) CHEMICAL: the cellular lining of the tracheobronchial tree produces certain non specific chemical substances which produce anti microbial action.

b) Immunological: The main immunoglobulin present in respiratory secretions is IgA. It is created by submucosal cells and mostly focused on viral infection defence.

CELLULAR ACTIVITY

Phagocytic cells capable of engulfing and destroying micro organisms provide cellular defence at alveolar level.

RESPIRATORY MUSCLES

These muscles are skeletal. They are necessary for proper ventilation. Breathlessness and ventilator failure are caused by overload and failure.

• The most significant inspiratory muscle is the diaphragm. Its contraction results in the diaphragmatic dome descending, the anterior abdominal wall shifting, the lower ribs rising, and the lower thorax expanding.

• Muscles between the ribs. External intercostal muscles are inspiratory and internal intercostal muscles are expiratory at resting lung capacity.

• The breathing muscles of the abdomen are strong.

• Neck muscles (sternomastoids and scalene) are auxiliary muscles of respiration

PATHOPHYSIOLOGY

Bacteria frequently reach the lower respiratory tract after being introduced to the lungs

through the upper airways. The majority of oropharyngeal micro aspirations occur in people who are sleeping or while they are sleeping. Some of the viruses are ingested as contaminated droplets from other afflicted individuals. The laryngeal, cough reflex, and pulmonary defence mechanisms typically prevent infection in the lower airways. Pneumonia is a condition that results in a breach in these.

• The turbinate and hairs of the nares, which filter the larger particles reaching the lungs, are one of the elements that significantly contribute to the host defences. The branching design of the tracheobronchial tree aids in mucociliary clearing and the expulsion of foreign objects. The healthy flora of the oro-pharynx keeps dangerous bacteria from adhering. Aspiration of oral contents is prevented by the gag reflex and cough reflex.

• Alveolar neutrophils and macrophages have potent antiviral and antibacterial properties. They also naturally kill due to their opsonizing traits. Immunoglobulins also aid in the treatment and prevention of infections.
Pneumonia happens when bacteria weaken these defences. When the organisms penetrate the alveoli, alveolar macrophages produce an inflammatory reaction that leads to pneumonia.

The fever response is brought on by IL-1 and TNF-alpha. The activation of neutrophil release by IL-8 and GM-CSF results in leukocytosis. The alveolar-capillary leak

syndrome brought on by these mediators can cause rales to be audible during auscultation, and a localised infiltration can be observed on a chest X-ray.

- The fluid-filled alveoli contribute to hypoxia, vasoconstriction, decreased compliance, and increased respiratory drive. The state of systemic inflammatory reaction, which results in widespread issues include respiratory alkalosis.

PATHOLOGIC AGENT:

Certain organisms have a special ability to overcome the host defences. For example, specific proteases from meningococcal and pneumococcal bacteria can destroy secretory IgA.

- Mycobacterium TB is resistant to the phagocytic activity of macrophages.

- Chlamydia and Mycoplasma can damage the cilia. Phagocytosis is inhibited by the pneumococcus capsular polysaccharide.
- The mucosal membrane and the ageing epithelium are under attack by gram-negative bacteria. As a result, these microbes cause infection by getting inside the alveoli.
- Pneumococcus is the pathogen that causes pneumonia the most frequently. Additionally, it is typically experienced by those who have heart failure, COPD, or pneumonia brought on by aspiration. Pneumonic effusions are developed in 25% of patients with pneumococcal pneumonia.

- Smoking is a significant independent risk factor for contracting a serious invasive disease, even among immune-competent people, especially in the middle-aged population. On a chest X-ray, lobar pneumonia is frequently visible. Hospital patients' mortality rates could rise to 7%.
- COPD and cystic fibrosis patients are more likely to contract infections from the gram-negative coccobacillus known as Hemophilus influenza.
- A Legionella species is responsible for about 2-9% of instances of pneumonia. It occurs naturally in freshwater. It could contaminate hot tubs, the cooling towers on large air conditioners, and hot water storage tanks. No proof of transmission from person to person exists.
- Two to nine days make up the incubation phase. Patients with Legionnaires' disease experience hemoptysis (30%), fever (100%) and sputum coughing (45–60%). GIT symptoms (vomiting and diarrhoea), for example, may be present in 50% of the patients. Cognitive CNS symptoms include things like impairment and confusion.
- Relative bradycardia is often seen in these circumstances. A variety of legionella organisms are identified. They are L.pneumophila, L.longbeachae, L.feelei, L.micdadei, and L.anisa of which legionella pneumophila is predominant.

- Fever, cough, headache, myalgia, rhinitis, tiredness, and atypical pneumonia caused by mycoplasma are its hallmark symptoms. The illness is called "walking pneumonia" because the vast majority of sufferers can move around.

- 25% of cases might also have dermatological symptoms, immunological symptoms, or problems with the central nervous system. It seems to happen more commonly in situations where people are in close and extended proximity, such as prisons, schools, military bases, and hostels.

Staphylococcus aureus

In intra venous and homosexuality Community-acquired MRSA is more common in drug users, prisons, and nomadic homeless people. It is followed by an otherwise asymptomatic young adult developing an influenza-like illness. Over the past 20 years, MRSA-related cases of CAP and VAP have increased.

Necrotizing pneumonia and multi-lobar cavitation are frequent side effects of the more severe form. More than 80% of MRSA pneumonia patients are admitted to the intensive care unit, more than 60% require mechanical ventilation, and more than 45% need a chest tube to be put in.

Gram-negative bacilli:

Due to gram-negative bacteria invading the oral cavity in diabetics, alcoholics, and critically ill patients, the frequency of gram-negative bacteria causing pneumonia has increased. The death rate is higher because impaired persons are more likely to experience it.

A bulging fissure sign and red currant jelly sputum are signs of Klebsiella in chest X-rays. Due to the advent of different treatment resistance, treating Acinetobacter is difficult. Beta-lactams and aminoglycosides are often combined to prevent medicine resistance.

. **Chlamydia Pneumonia:**

The prevalence of this bacterium varies significantly across investigations as a result of changes in the diagnostic methods used. Airborne droplets are used in droplet-based transmission, which has been connected to outbreaks and greater incidence in crowded settings.

Group A Streptococcus, which frequently causes fulminant pneumonia and earlier empyema formation, typically affects young adults. These species are always present, although being uncommon. It causes atypical pneumonia.

Anaerobes:

Lung abscess and aspiration pneumonia are more likely to result from them. Prevotella, Fusobacterium, Bacteroides, Peptostreptococcus, and Porphyromonas are the genera of anaerobes that are isolated the most frequently. Predisposing factors include phenytoin prescription, periodontitis, gingivitis, and poor dental hygiene. They are more common in alcoholics, stroke patients, and individuals with IV drug addictions. Acute empyemas

also frequently develop in this group of patients.

Flu, para-influenza viruses, adenoviruses, rhinoviruses, respiratory syncytial viruses, hantaviruses, coronaviruses, Epstein-Barr virus, cytomegalovirus, coxsackie viruses, herpes zoster viruses, and human meta pneumonia virus are the most often implicated viruses. Tissues can be harmed in different ways. While some of them cause direct pneumocyte destruction, the primary mechanism is inflammation caused by an immune reaction.

. **Influenza pneumonia:**

They are in charge of pandemics' seasonal variations. They have a high mortality rate, even in immunocompetent young persons. When an infected individual speaks, coughs, sneezes, or discharges tiny droplets, transmission occurs. The incubation phase usually lasts between one and two days. It can either cause primary pneumonia, which is pneumonia brought on by the virus alone, or secondary pneumonia, which develops after a few days (caused by a mix of viruses and bacteria). Myocarditis and pleural effusion can both occur at the same time.

Other strange organisms Most of the time, sick sheep, cattle, and goats transfer Coxiella Burnetti, the virus that causes Q fever, through contaminated aerosols. Tularemia is a zoonotic illness brought on by Francisella tularensis, which can be acquired from either

parrots or rabbits. Other rare diseases include glanders' pneumonia, actinomycosis, listeria, melioidosis, and nocardia.

Patients receiving immunosuppressive medicine, those with diabetes, those undergoing chemotherapy, and those who are HIV positive are more likely to develop **fungal pneumonia**, which can be dangerous. Histoplasmosis is a common infection among visitors to the Ohio islands. Visitors to the southwest of the United States have an increased risk of contracting coccidioidosis.

OCCUPANT FACTORS:

Cognitive decline, In particular during sleep, altered consciousness can result in both macro aspiration of stomach contents (induced by a stroke, seizure, anaesthesia, or alcohol abuse) and micro aspiration of upper airway secretions.

Pneumococcus makes up 20–60% of all cases when an organism is discovered in situations involving older people. Age >65, inadequate host immune response, poor oral hygiene, aspiration risk, numerous comorbid diseases, frequent hospitalisation, and poor dental hygiene are all risk factors for dementia in the elderly. 5–14% of cases of H. influenza and Legionella pneumonia were isolated.

The microbiological patterns seen in the elderly are typically not considerably different from those in younger people. The widespread and fatal systemic illness.

COPD:

Although Pseudomonas aeruginosa and other Gram-negative bacilli may be more prevalent in COPD patients, the range of causative bacteria is not considerably different from that of those without COPD. Patients with CAP usually have COPD as a coexisting condition. There is scant proof that COPD causes CAP mortality to rise.

Alcohol use:

A higher relative risk of CAP will result from alcohol consumption. Pneumococcus is the most typical pathogen discovered, and these people have a higher rate of CAP, which is bacteremia. There was no change in death despite alcoholism having more severe CAP. A substantial link between Klebsiella and CAP in drinkers has repeatedly been found.

Diabetes:

Diabetes is one of the co-morbidities that is most frequently reported, according to statistics from India. Disease-causing agents, bacteremia rates, or empyema rates did not differ between diabetes patients and the general population. However, diabetes was frequently prevalent in individuals with pneumococcal pneumonia and bacteremic sepsis and was strongly associated with a higher death rate. The most plausible mechanism was the worsening of pre-existing cardiac and renal illness.

The following are the additional risk factors:

Acidosis

inhaling toxins

Uremia

Malnourishment

Dysplastic fibrosis

Bronchiectasis instances of persistent bronchitis in the past Syndrome of immotile cilia having HIV,

Young's disease (azoospermia, sinusitis, pneumonia)

esophageal cancer,

scleroderma,

achalasia cardiac-related dysphagia a lung cancer occlusion of the bronchi owing to stenosis, a tumor, or a foreign object

Drugs:

Studies have looked into the idea that people taking PPIs and H2 blockers, which inhibit the production of stomach acid, may be more likely to develop CAP.

Although the precise causes are yet unknown, antipsychotic drugs have been related to CAP in various trials. According to one study, elderly patients who needed to be hospitalised had a pneumonia risk that was roughly 50%–60% greater when taking antipsychotic drugs.

PATHOLOGY OF PNEUMONIA:

The two main anatomical patterns for bacterial pneumonia are lobular bronchopneumonia and lobar pneumonia. The following list describes the four stages of lobar pneumonia:

STAGE OF CONGESTION:

The lungs are heavy, sluggish, and red at this stage of congestion. This phase is characterised by the engorgement of blood vessels, the accumulation of intra alveolar fluid containing numerous neutrophils, and frequently the presence of numerous organisms.

STAGE OF RED HEPATIZATION:

The alveolar gaps are lined with inflammatory fibrin during the red hepatization stage, which is characterised by extensive exudation, RBCs, neutrophils, and other cellular components. Hepatization is the term used to describe the new, distinct look of the lung upon gross examination, which is dark, rigid, and airless with a solid consistency matching that of the liver.

STAGE OF GREY HEPATISATION

When red blood cells progressively lyse and fibrin suppurative exudates are present, a stage of hepatization known as "grey hepatization" occurs, giving the surface of the lung a rough, dry, and greyish-brown look. The accumulating exudates inside the alveolar spaces gradually undergo enzymatic breakdown to create liquid debris during the

resolution stage, which is distinct from it. Fibroblasts shape them, and then macrophages take them in.

CLINICAL FEATURES:

Fever, a decline in overall health, and respiratory symptoms including

Cough (90%),

Sputum production (66%),

Dyspnea (66%),

Pleuritic discomfort (50%),

hemoptysis (15%),

are all signs of pneumonia

In aged and immune-compromised patients, the signs and symptoms of lung infection may be milder and hidden by general health issues. Rarely will a patient with a pneumococcal infection present with a "typical" history, such as an abrupt start of rigidity followed by pleuritic chest pain, dyspnea, and a cough that produces rust-colored sputum. Similar to this, symptoms of Legionella pneumonia include diarrhoea, fever, headache, disorientation, and myalgia.

Myringitis, encephalopathy, uveitis, iritis, and myocarditis are possible extrapulmonary symptoms of Mycoplasma pneumonia.

However, the clinical history almost never indicates a specific etiological diagnosis. Particularly in those who have several concomitant conditions, pneumonia might present in elderly persons as generalised weakness, decreased appetite, altered mental status, incontinence, or decompensation of an underlying illness.

Although less common and general than tachypnea, tachycardia is another typical early indicator. In 30 to 40 percent of elderly individuals, there is no fever. Tachypnea may be present 1 to 2 days before other pneumonia symptoms are visible. Flu-like symptoms, fever, tachypnea, tachycardia, and lung crackles are the predominant clinical signs of pneumonia. Antibiotics may not be administered for more than 4 hours to elderly pneumonia patients who have altered mental status and no fever, which raises mortality.

20% to 50% of individuals have CAP when all five criteria are satisfied. Particular indications of pulmonary consolidation are only present in one-third of instances that require hospitalisation, and they are frequently absent in patients who are healthier. Bacterial pneumonia is observed to have greater blood levels of C-reactive protein and erythrocyte sedimentation rate than viral pneumonia.

Greater severity of pneumonia and higher mortality rates are linked to thrombocytopenia and thrombocytosis. Physical examination results that don't include a fever or show pain or a cough early in the disease' progression can be normal.

After a patient is suspected of having pneumonia, laboratory tests such as arterial blood gas assays, blood cell counts, serum glucose measurements, and electrolyte evaluations should be performed. They provide a basis on which to judge whether hospitalisation is required. Even those without any other CAP risk factors should get tested for HIV. More typically, significant leukocytosis with a left side shift is linked to infections caused by S. pneumoniae and H. influenzae. as well as influenza and gram-negative bacteria. Leucopenia may be present in patients with severe pneumococcal or gram-negative bacterial pneumonia.

PROCALCITONIN:

In order to determine the severity, prognosis, and progression of pneumonia, PCT assays have been utilised. PCT is a precursor to calcitonin and is more prevalent in the blood of persons who have bacterial infections. Procalcitonin is essential because when levels drop below a set threshold, it is utilised to either inhibit or stop the effectiveness of antibiotics.

RADIOLOGY:

If at least one of the following abnormalities is visible on the chest X-ray, CAP may be suspected as the cause: an asymmetric increase in lung opacification with air bronchogram;

(ii) the presence of the silhouette sign;

(iii) an area of increased opacity, bounded by a well-defined interface against adjacent aerated lung (such as along a fissure);

(iv) increased attenuation of the cardiac shadow (in supine AP film); and (v) the presence of the silhouette sign.

A chest radiograph is the most frequent tool used to differentiate CAP from other acute respiratory symptoms-causing conditions such pulmonary edoema, infarction, effusion, or tuberculosis. It's important to note that during follow-up, the disappearance of chest radiograph abnormalities may not correspond to clinical recovery because, in up to 50% of patients, radiographic resolution may not be complete at 4 weeks.

DIFFERNTIAL DIAGNOSIS

Pulmonary edema

Lung infarction

Effusion

Tuberculosis

Occupational lung diseases

Malignancy

Diagnosis of microbes

A valid sputum sample, two blood cultures (obtained before to taking antibiotics), a gramme stain, and the need for hospitalisation are all microbiological requirements that patients must satisfy. Testing for Legionella pneumophila in urine is done in areas where it is endemic or during outbreaks. Similar to this, a tuberculosis sputum culture and acid-fast bacilli stain are carried out if the clinical history or radiologic indications indicate it.

Pneumocystis jiroveci sputum testing.

In endemic regions or during outbreaks, respiratory viruses such as Mycoplasma pneumoniae, Chlamydophila pneumoniae, Chlamydophila psittaci, Coxiella burnetii, and Legionella species should be particularly tested for using nucleic acid amplification techniques (if suggested by clinical history or radiologic findings). Plural fluid culture and microscopic inspection are further options (if sufficient fluid is present).

ICU PATIENT ADDITIONAL TESTS:

If the initial tests are inconclusive, hospitalised patients may have further procedures such as gram staining, culture, or BAL of an endotracheal aspirate or bronchoscopically acquired specimen.

(1) The most recent IDSA/ATS guidelines recommend obtaining a sputum sample for Gram stain and culture in hospitalised patients with the clinical criteria listed below, even

if these tests are optional for people who don't have these symptoms.

Commercial antigen detection kits are easily available, and they contain the pneumococcus and legionella pneumophila serotype 1 capsular polysaccharide antigens. The advantages include results that are available in less than an hour and outcomes that are unaffected by antibiotics. Additionally, the degree of pneumococcal antigen positivity is linked with the severity.

This technique can also be used to quickly detect viruses like the influenza virus. The gold standard in diagnosis is thought to be nucleic acid amplification for organisms like Chlamydia, bordetella, and certain viruses that cannot be found by conventional cultural approaches.

Bronchoalveolar lavage offers greater sensitivity and parity with specificity in BAL testing.

Multiple diagnoses:

Other conditions that resemble pneumonia include: o ARDS o Pulmonary infarction o Edema pulmonary o Pulmonary bleeding o Lung tumours, o Radiation pneumonitis, o Lung-related drug responses, o Pulmonary vasculitis, o Pulmonary eosinophilia, o Organising pneumonia. When radiological indicators quickly fade or remain for a long time, they should be taken into account.

It's crucial to think about your options for therapy when pneumonia has been diagnosed. the patient's ability to get care as an outpatient or whether hospitalisation is required. If admitted, it is important to determine whether ICU stay is necessary.

The clinical evaluation is essential for decision-making. However, it has been demonstrated that relying solely on clinical judgement can result in unnecessary hospitalizations or the neglect of patients who should be admitted. As a result of better patient triage due to the use of scoring systems for admission and prognosis access, there is more consistency and better patient outcomes.

As delayed admissions and delayed transfers to the intensive care unit have significantly impacted the mortality and prognosis of patients, the early decision-making is crucial to the patient's result.

Here are some examples of frequently used scoring systems:

PSI SCORING:

The PSI rule is being validated using data from a prospective cohort study conducted by the Pneumonia Patient Outcomes Research Team (PORT), which identified individuals with CAP and associated mortality risks. In addition, the PSI classified adults with CAP into five groups based on how likely it was that they would pass away within 30 days from all causes. At the time the patient presented, variables based on the 24 histories, the

physical examination, a few lab results, and radiographic data were not

British Thoracic Society recommendations for CURB 65 grading include a straightforward system with one point awarded for each presentation's findings:

(1) Disorientation;

(2) BUN more than 19 mg/dl or 7 mmol/L

(3) A respiration rate of 30 or greater;

(4) Low systolic or diastolic blood pressure;

(5) Being 65 years of age or older.

It is advised to seek outpatient care for 0 or 1 point. Hospitalization is advised for scores of three or higher, while brief inpatient or closely monitored outpatient care is advised for scores of two.

CRB65

A condensed version (CRB-65) was created that may be used for decision-making even at the primary level without the need for laboratory testing.

Health facility

However, if one or more of the 28 requirements are met in this situation, hospitalisation is indicated. The CRB65 scores of more than 6000 patients at community hospitals and

tertiary care centres have been thoroughly examined. All investigations presented results that were in line with those of the derivation research, and a number of studies asserted that the CRB65 score and the CURB65 score had similar discriminatory powers.

Predisposition, Insult, Response, and Organ Dysfunction, or PIRO, was created to predict death in patients with severe CAP admitted to the

ICU and the APACHE-II score as well as the IDSA/ATS-recommended ICU admission standards were compared. Within 24 hours of ICU admission, the PIRO score was generated for 529 patients, awarding one point for each of the following conditions, with a maximum score of 8.

Co-morbidities

- Chronic obstructive pulmonary disease,
- Immuno-compromised and age >70 years,
- Multi-lobar opacities on chest radiograph,
- Shock,
- Severe hypoxemia,
- Acute renal failure,
- Bacteremia, and
- Acute respiratory distress syndrome.

CAP treatment

The selection of an antibiotic is based on a unique risk-benefit analysis that takes into account the patient's characteristics, including drug allergies, the risk of cardiac arrhythmia with macrolide antibiotics or vascular disease with fluoroquinolones, or a history of Clostridioides difficile infection (previously Clostridium difficile infection). Despite worries about fluoroquinolone side effects, the ATA/IDSA panel determined that these medications are appropriate for the treatment of outpatients with comorbidities and CAP.

One of these two regimens is typically the standard therapy for inpatient empirical antibiotic coverage of CAP: a second-or a combination of both

• A fluoroquinolone with efficiency against respiratory pathogens, such as levofloxacin, moxifloxacin, or gatifloxacin, in conjunction with a third-generation cephalosporin. North American guidelines state that any empirical CAP treatment strategy should be effective against "atypical" illnesses like M. pneumoniae, C. pneumoniae, and L. pneumophila. According to retrospective analyses of individuals hospitalised with CAP, clinical outcomes are associated with regimens that cover "atypical" pathogens and those that follow ATS and IDSA recommendations.

No risk factors for MRSA or Pseudomonas

Amoxycillin 1000mg every 8 hrs

Or

Doxycycline 100 mg every 12 hrs

Or

Macrolides(Azithromycin or Clarithromycin)

If risk factors like alcoholism,asplenia,diabetes present

Combination of

Amoxicillin/Clauvulanate (500mg/125 mg every 8 hrs or 875/125 mg every 12 hrs or 2000mg/125 mg every 12 hours)

Or

Cefpodoxime 200mg every 12 hours

Or

Cefuroxime axetil 500 mg every 12 hours.

Plus

Azithromycin/Doxycycline

Or monotherapy with levofloxacin 750 mg,moxifloxacin 400 mg

TREATMENT OF HOSPITALISED PATIENTS WITH COMMUNITY ACQUIRED PNEUMONIA

For non-severe pneumonia without risk factors for MRSA or pseudomonas

COMBINATION OF

Ampicillin/sulbactum 1.5 to 3 g every 6 hours

Or

Cefotaxim 1 to 2 g IV every 8 hours

Or

Ceftaroline 600 mg iv every 12 hours

Or

Ceftriaxone 1 to 2 g iv everyday

PLUS

Azithromycin 500 mg orally /iv

Or clarithromycin

Or

Monotherapy with

Levofloxacin/Moxifloxacin

SEVERE PNEUMONIA WITHOUT RISK FACTORS FOR MRSA OR PSUDOMONAS

Combination of

Ampicillin/sulbactum1.5 to 3 g iv or

Cefotaxim or

Ceftaroline or

Ceftriaxone

Plus

Azithromycin 500mg or

Clarithromycin 500 mg or

Levofloxacin 750mg or

Moxifloxacin 400 mg

NONSEVERE PNEUMONIA WITHOUT RISK FACTORS FOR MRSA OR PSUDOMONAS and CONTRAINDICATIONS TO MACROLIDES

Add doxycycline

SEVERE PNEUMONIA WITH LOCALLY VALIDATED RISKS LIKE MRSA or PSEUDOMONAS

Linezolid 600 mg oral or iv every 12 th hourly

Or

Vancomycin 15 mg /kg IV every 12 hours

For Pseudomonas aeruginosa risk factors

Aztreonam 2g iv every 8 hours

Or

Cefepime 2g iv every 8 hours

Or

Ceftazidime 2g iv every 8 hours

Or

Imipenem cilastatin 500 mg iv every 6 hours

Or

Meropenem 1 g iv every 8 hours

Or

Piperacillin Tazobactum 4.5 g iv every 6 hours.

It is critical to realise that all recommendations for CAP treatment are based on specific epidemiological or clinical information from these regimens.

Features in individuals at high risk for certain CAP infections, such as gram-negative Enterobacteriaceae or P. aeruginosa, or mixed aerobic-anaerobic flora brought on by aspiration.

• Fluoroquinolones should be used cautiously in CAP situations where tuberculosis is a concern because it only takes 10 days of fluoroquinolone therapy for M. tuberculosis to develop fluoroquinolone resistance.

• When selecting a regimen, it is important to consider the history of recent usage of any anti-microbial drug. Ciprofloxacin use is common, and up to 13°/o of S. pneumoniae isolates in Hong Kong received sub-therapeutic fluoroquinolone dosages, both of which have been linked to fluoroquinolone resistance. Fluoroquinolone resistance and subsequent treatment failures in pneumococcal CAP have been described; however, this occurs less frequently when fluroquinolones are taken because of their better effectiveness against respiratory infections.

However, until in vitro testing reveals that S. pneumoniae has a significant prevalence of

macrolide resistance, a macrolide shouldn't be utilised as a sole treatment for S. pneumoniae infection.

- The patient's strain is successfully combated by the macrolide.
- Because there is still a lack of information on the condition, empirical antibiotic treatment for severe CAP (SCAP) is still up for debate. Penicillin-sensitive pneumococci remain to be the most likely cause, despite the fact that the range of etiologies is probably greater than in CAP. Whether CAP always necessitates more severe diagnostic tests or a wider range of empirical treatments has not been shown through larger studies.
    - Retrospective studies have found a 33% decreased mortality associated with combination therapy, specifically for severe pneumococcal pneumonia and for CAP in general.
- A significant number of older CAP patients who needed hospitalisation responded to azithromycin treatment with a lower 90-day risk of death compared to other antibiotics.

THERAPY USING CORTICOSTEROID AND ANTIVIRALS:

For individuals with CAP or severe influenza pneumonia, corticosteroids shouldn't be routinely provided. Despite the fact that corticosteroids were given in two studies to treat CAP, the results of these studies were flawed, and subsequent investigations have not

demonstrated changes in clinically significant outcomes.

Adults with CAP who test positive for influenza should be provided antiviral medications, regardless of the length of sickness prior to diagnosis or the location of the therapy. There is evidence to support the use of antivirals after 48 hours of the onset of symptoms, even though this is when the benefits are highest.

Pneumonia biomarkers:

However, pneumonia is a multisystemic illness with cardiovascular consequences. Immunity, immune control, and coagulation.They have all been changed. With less protein synthesis, the condition is more catabolic. Therefore, the biomarkers are a great indicator of disease activity. The most often utilised biomarkers are

- CRP ,
- Serum albumin,
- Procalcitonin,
- IL-6,
- Proadrenomedullin,
- Red cell distribution width,
- D-dimer,
- BNP,
- Kalistatin,
- Vistatin,

- Copeptin,
- Vitamin D

Early markers include pleural effusion on chest X-ray, high CURB 65, and IL 6. Procalcitonin and CRP are late predictors that are elevated in severe illness.

This pre-B-cell colony-enhancing factor is called vistatin. Studies have revealed a significant correlation between this molecule and prognosis ratings.

CRP and IL-6 are more accurate indicators of prognosis and mortality.
Patients with CRP levels under 100 mg/dl frequently experience reduced death rates than patients with CRP levels over 100 mg/dl.
Kalistatin is an inhibitor of serine proteases. Transport, inflammation, and blood pressure regulation depend on them.
Platelet counts of less than one lakh and greater than four lakhs are linked to a worse prognosis.

Positive correlations have been found between SUPAR-soluble urokinase type Plasminogen Activator Receptor and immune system activation and regulation.

VITAMIN D

The role of vitamin D in immunomodulation is extensively recognised, and vitamin D

levels in pneumonia reflect this. Symptoms of a vitamin D deficiency include systemically inflammatory illnesses like pneumonia.
When used in conjunction with CURB 65 and PSI score, levels with a reduction in vitamin D levels can be predicted.

Although a number of biomarkers have been described, their value in clinical practise is hotly debated. In all 35 hospitals, the bulk of them are not easily accessible, with the exception of a few tertiary centers. Even in higher tertiary centers, they must be reachable around-the-clock in order to be effective in establishing the right atmosphere and prioritizing the cases. These signs are not, however, available all the time. Furthermore, their cost is quite high.

ALBUMIN

Blood albumin testing done within 24 hours of admission has been found to be a reliable diagnostic for determining the prognosis and identifying high risk patients with community acquired pneumonia.

The sensitivity and specificity of problem detection have been significantly enhanced by serum albumin and PSI/CURB 65. Hypoalbuminemia (albumin levels below 3 gm/dl), which affects CAP mortality and sequelae, was shown to have an effect. This prospective cohort study with 3463 patients was carried out in 2014.

Albumin is a protein that is made in the liver. Albumin gets its name from the white precipitate that occurs after egg boiling. The Latin word albus, which means white, is where it derives. The half-life of albumin is 20 days or such.

On average, the liver generates 12 grams of albumin every day.
They are scattered across the vascular compartment, interstitial fluid, and CSF.
The uses of albumin are numerous.

- By exerting effective osmotic pressure, it maintains a steady colloidal osmotic pressure in the plasma.
-
- Because albumin can be absorbed by all tissues through pinocytosis and can be broken down into amino acids by all tissues, it transports all the substances that the plasma is unable to breakdown.
- Albumin's histidine residues aid in the buffering function of the plasma.
- Albumin, a negative phase reactant, decreases in response to inflammation. Transferrin, Retinol Binding Protein, and Transthyretin (Prealbumin) are the extra negative phase reactants. Hypoalbuminemia in hospitalised patients can have a variety of causes.

INTERLEUKIN 6

Therefore, it may be concluded that serum albumin levels within 24 hours were an accurate indicator of the difficulties.

Albumin has significantly improved the sensitivity and specificity of scoring systems' complication prediction capabilities.

The IL-6 that is released during an inflammatory reaction by bacteria and other organisms prevents the hepatocytes from synthesising albumin.

Chemokines also play a role because they make blood vessels more permeable, which releases albumin into extra vascular space and results in hypoalbuminemia.

Other causes of reduced albumin include stress, surgical complications, poor nutrition, and post-radiation.

Additionally, they carry hormones like thyroxine and cortisol that may be beneficial in inflammatory circumstances and have an anti-apoptotic effect.

Large-scale research, however, were unable to demonstrate the benefits of administering albumin infusions during the inflammatory phase. In terms of mortality or outcome metrics, there were no differences between the groups receiving normal saline and the ones receiving albumin. The relationship between dietary status and albumin levels on the day of admission in pneumonia and sepsis has been the subject of numerous

investigations.

Hypoalbuminemia and dietary status did not, however, appear to be related. These studies do not provide evidence in favour of supplementing albumin in pneumonia patients with low albumin levels.

Albumin does, however, have some capabilities for preventing systemic diseases. Frequently, they regulate the acid-base balance and offer protection against oxidative damage.

Serum albumin estimation is therefore now a part of more current scoring schemes. Albumin levels are now taken into account by the following grading systems:

EXPANDED CURB 65:

It incorporates three more characteristics in addition to the CURB 65 scoring. LDH >230 micrograms/litre are what they are.

Serum albumin less than 3.5 g/dl

1 lakh platelets are present.

As was already mentioned, CAP causes a drop in serum albumin levels. Serum albumin levels were a good indicator of the severity because the cytokines shifted the amino acids to synthesise the acute phase reactant proteins.

A poor prognostic indicator is the low platelet count. Sepsis, disseminated intravascular

coagulation, and related liver disease are all associated with low platelet counts and have unfavourable prognostic implications.

Expanded CURB 65 exhibited the strongest negative predictive value and the highest sensitivity in recent studies(55) on mortality prediction. They are especially helpful for people with cirrhosis who have a high mortality rate.

However, pneumonia is a multisystemic illness with cardiovascular consequences. The immune system, immune control, and the coagulation cascade are all affected. It has less protein and is more catabolic.

Therefore, the biomarkers are a great indicator of disease activity.

MATERIALS AND METHODS

MATERIALS AND METHODS

The present study titled**" A COMPARATIVE STUDY OF THE PROGNOSTIC SIGNIFICANCE OF CURB65 AND EXPANDED CURB65 IN COMMUNITY ACQUIRED PNEUMONIA PATIENTS**" was carried out in the Department of General Medicine, Government Royapettah Hospital, Government Kilpauk Medical College Hospital, Chennai.

1. Study design

Prospective cohort study

2. Period of study

APRIL 2022 to SEPTEMBER 2022

3. Duration of study

6 months

4. Place of study

Government Royapettah Hospital

5. Study population

Inclusion criteria:

1. Age more than 18 years of both sex
2. Patients with at least two clinical signs and symptoms related to pneumonia (fever, cough, chest pain, dyspnoea and crackles on auscultation)
3. New infiltrates on chest x ray

Exclusion criteria:

1. Age < 18 years
2. Malabsorption and malnutrition status
3. HIV infection
4. Organ transplant recipient
5. On immunosuppressant and steroids
6. Pregnancy and lactation
7. Symptoms after 48 hours of hospitalisation

Sample size

100 patients of community acquired pneumonia in Government Royapettah Hospital.

From literature, the sensitivity of the CURB in predicting the 30 day mortality was found to be 66.67 anticipating the same in our study with 95% confidence level and 10% precision the sample size was calculated to be 85, after accounting for 10% loss the final sample size was calculated to be 92, the final sample was rounded of to 100.

The sample size was calculated using nMaster version 2.0

METHODOLOGY

Study will include patients presenting to our institute with clinical features suggestive of community acquired pneumonia. Patients will be subjected to thorough history taking to collect information on presenting symptoms, its duration, addictions & comorbid conditions. Patients will be examined and vital signs and findings of systemic examination will be recorded. Patient will undergo routine blood investigations (including complete blood count, renal and liver function tests and serum LDH .Serum albumin, LDH and platelet levels will be obtained on day of admission. CURB 65 and expanded CURB 65 will be calculated.. Further patient's length of hospital stay, need for intensive medical care, need for mechanical ventilation and in hospital mortality will be calculated and will be compared with both the scores.

CURB65 calculation

C-Confusion (new confusion to time , place and person)

U- Blood urea nitrogen more than 19 mg/dl

R- Respiratory rate of 30 and more

B-Low systolic blood pressure (<90mmm hg) or diastolic blood pressure (<60mmhg)

AGE>65 years

0-1 low risk-home treatment

2 in patient

3-5 manage as severe

EXPANDED CURB 65 SCORE

1. AGE >65 years
2. CONFUSION
3. BLOOD UREA NITROGEN>19mmol
4. RESPIRATORY RATE >30

5. BLOOD PRESSURE - :systolic blood pressure <90mmhg or

   Diastolic blood pressure<60mmhg

6. SERUM ALBUMIN- <3.5

7. SERUM LDH >230

8. PLATELET COUNT < 100000

Calculation

(0-1 low risk

3-4 intermediate risk

5 -8 high risk)

BUN CALCULATION:

BUN(mg/dl) =urea (mg/dl) ÷ 2.1428 and 1 point is given if the value is above 19 mg/dl

1 point is given for each variable and total score is calculated.

RESULTS

RESULTS AND ANALYSIS

The present study titled

"**A COMPARATIVE STUDY OF THE PROGNOSTIC SIGNIFICANCE OF CURB 65 AND EXPANDED CURB 65 IN COMMUNITY ACQUIRED PNEUMONIA PATIENTS ADMITTED IN TERTIARY HOSPITAL**"

Was undertaken in the Government Royapettah General Hospital, Chennai over six months. The study sample included 100 patients with pneumonia in the wards.

TOTAL CASES OF study: 100

AGE DISTRIBUTION: TABLE 1

AGE GROUP	Frequency	Percent
<40	4	4.0
41-50	11	11.0
51-60	29	29.0
61-70	33	33.0
Above 70 years	23	23.0
Total	100	100.0

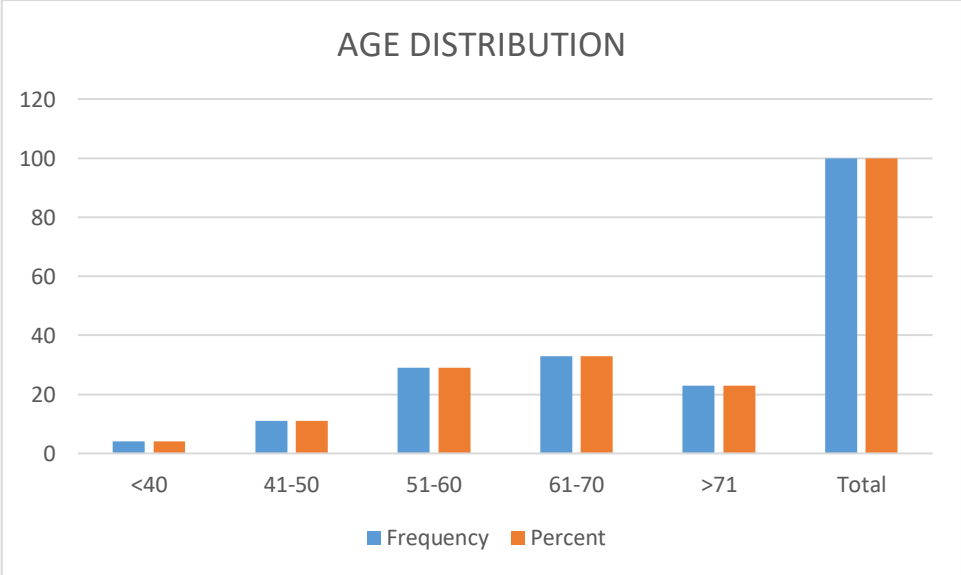
In our study we found that majority of cases in our study were between age of 50 to

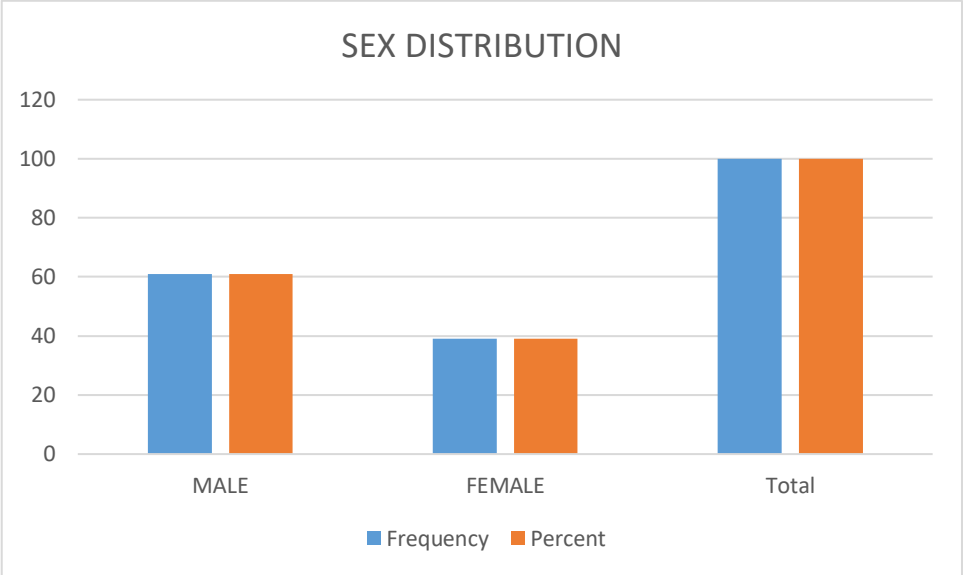
70(62%) with particular crowding in the age group between 61 to 70 years(33%)

SEX DISTRIBUTION: TABLE 2

SEX	Frequency	Percent
MALE	61	61.0
FEMALE	39	39.0
Total	100	100.0

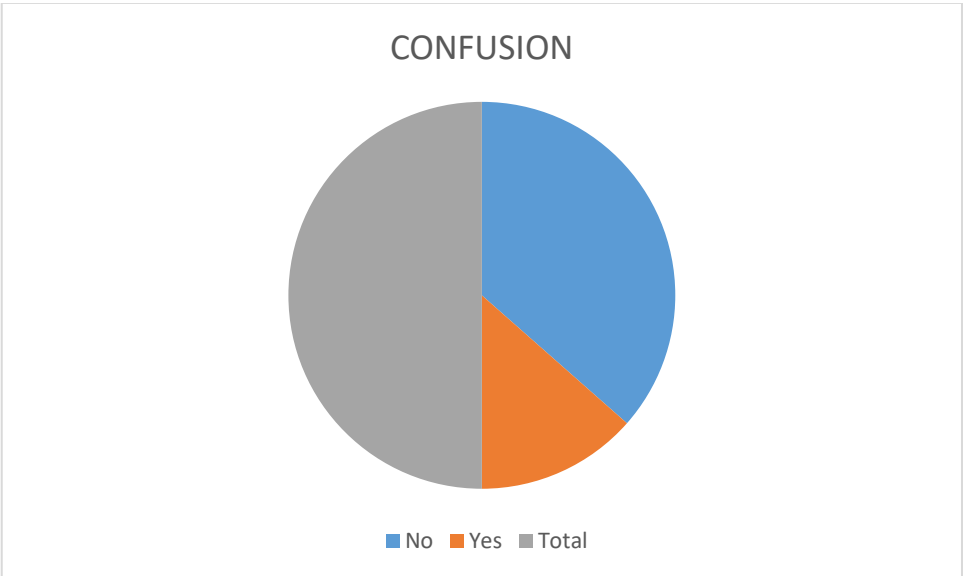
Among the sex distribution, number of males and females were 61 and 39 respectively with majority of male patients (61%)



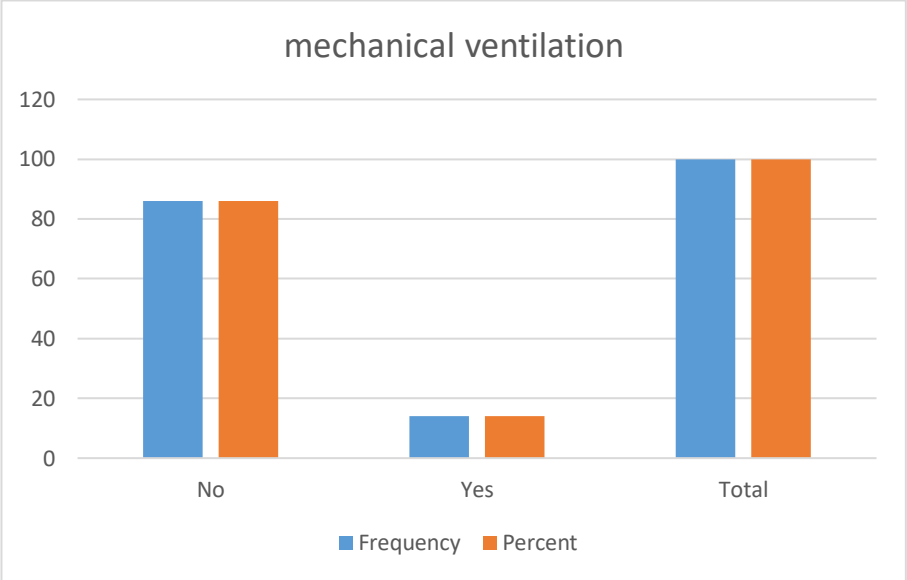


CONFUSION: TABLE 3

CONFUSION	Frequency	Percent
No	73	73.0
Yes	27	27.0
Total	100	100.0



MECHANICAL VENTILATION



MECHANICAL VENTILATION	Frequency	Percent
No	86	86.0
Yes	14	14.0
Total	100	100.0

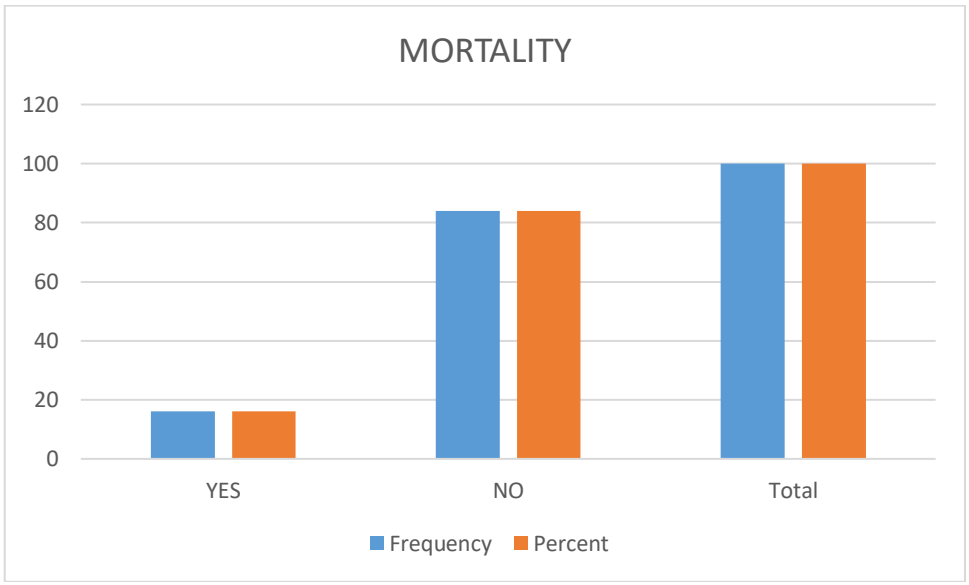
Out of 100 patients 14 patients received mechanical ventilation in intensive care

ICU ADMISSION(Table 5)

ICU admission	Frequency	Percent
No	69	69.0
Yes	31	31.0
Total	100	100.0

MORTALITY IN CAP PATIENTS(table 6)

MORTALITY	Frequency	Percent
YES	16	16.0
NO	84	84.0
Total	100	100.0



Out of 100 patients 31 patients were admitted to intensive care and 14 patients were under mechanical ventilation support and 16 patients died due to complications of community acquired pneumonia.

correlation between lab parameters and mortality in community acquired pneumonia patients(table 7)

	MORTALITY				P value
	YES		NO		
	Mean	Standard Deviation	Mean	Standard Deviation	
BUN	20.75	9.28	16.13	4.69	0.003
HB	10.57	2.26	10.83	1.76	0.61
PLT	107125.00	107130.99	203026.19	142859.75	0.012
S.ALB	2.85	0.56	3.42	0.66	0.002
S.LDH	381.56	164.33	286.29	151.45	0.025

The mean blood urea nitrogen among the patients who succumbed to community acquired pneumonia was 20.75 and 16.13 in the alive group. The mean platelet count was 1.07 Lakh in those who died of community acquired pneumonia whereas the mean platelet among the alive group was 2.03 lakh. The mean LDH value among the patients who died of community acquired pneumonia was 381.56 whereas the mean value among the alive patients was 286IU/L. The mean albumin levels in those who died of community acquired pneumonia was 2.85 and the mean albumin levels in the living patients was 3.42 which was statistically significant (0.002).

CURB 65 and E-CURB 65 correlation with length of hospital stay(table 8)

		LENGTH OF HOSPITAL STAY
CURB-65	Pearson Correlation	0.521
	P value	<0.0001
E-CURB 65	Pearson Correlation	0.763
	P value	<0.0001

Correlation between serum albumin and hospital stay(table 9)

		LENGTH OF HOSPITAL STAY
S.ALB	Pearson Correlation	-0.511
	p value	<0.0001

CURB 65 SCORES AND MECHANICAL VENTILATION(table 10)

			MECHANICAL VENTILATION		Total	P value
			No	Yes		
CURB-65	Low risk	Count	45	4	49	0.019
		% within CURB-65	91.8%	8.2%	100.0%	
	Inpatient	Count	30	4	34	
		% within CURB-65	88.2%	11.8%	100.0%	
	Severe	Count	11	6	17	

		% within CURB-65	64.7%	35.3%	100.0%	
Total		Count	86	14	100	
		% within CURB-65	86.0%	14.0%	100.0%	

CURB 65 SCORES AND ICU ADMISSION RATES(table 11)

			ICU admission		Total	P value
			No	Yes		
CURB-65	Low risk	Count	42	7	49	<0.0001
		% within CURB-65	85.7%	14.3%	100.0%	
	Inpatient	Count	22	12	34	
		% within CURB-65	64.7%	35.3%	100.0%	
	Severe	Count	5	12	17	
		% within CURB-65	29.4%	70.6%	100.0%	
Total		Count	69	31	100	
		% within CURB-65	69.0%	31.0%	100.0%	

CURB 65 SCORES AND MORTALITY(table 12)

			MORTALITY		Total	P value
			YES	NO		
CURB-65	Low risk	Count	2	47	49	<0.0001
		% within CURB-65	4.1%	95.9%	100.0%	
	Inpatient	Count	5	29	34	
		% within CURB-65	14.7%	85.3%	100.0%	
	Severe	Count	9	8	17	
		% within CURB-65	52.9%	47.1%	100.0%	
Total		Count	16	84	100	
		% within CURB-65	16.0%	84.0%	100.0%	

EXPANDED CURB 65 AND MECHANICAL VENTILATION RATE(table 13)

			MECHANICAL VENTILATION		Total	P value
			No	Yes		
E-CURB 65	Low risk	Count	39	0	39	0.002
		% within E-CURB 65	100.0%	0.0%	100.0%	
	Intermediate risk	Count	29	6	35	
		% within E-CURB 65	82.9%	17.1%	100.0%	
	High risk	Count	18	8	26	
		% within E-CURB 65	69.2%	30.8%	100.0%	
Total		Count	86	14	100	
		% within E-CURB 65	86.0%	14.0%	100.0%	

Expanded curb 65 scores with score 0-2,2-4 and 5-8 are graded as low risk, intermediate risk and high risk respectively. Among the low risk patients none of them needed mechanical ventilation ,17 percentage persons needed mechanical ventilation among the intermediate risk and 38% patients needed mechanical ventilation support among the high risk group.

SERUM ALBUMIN AND HOSPITAL STAY(table 14)

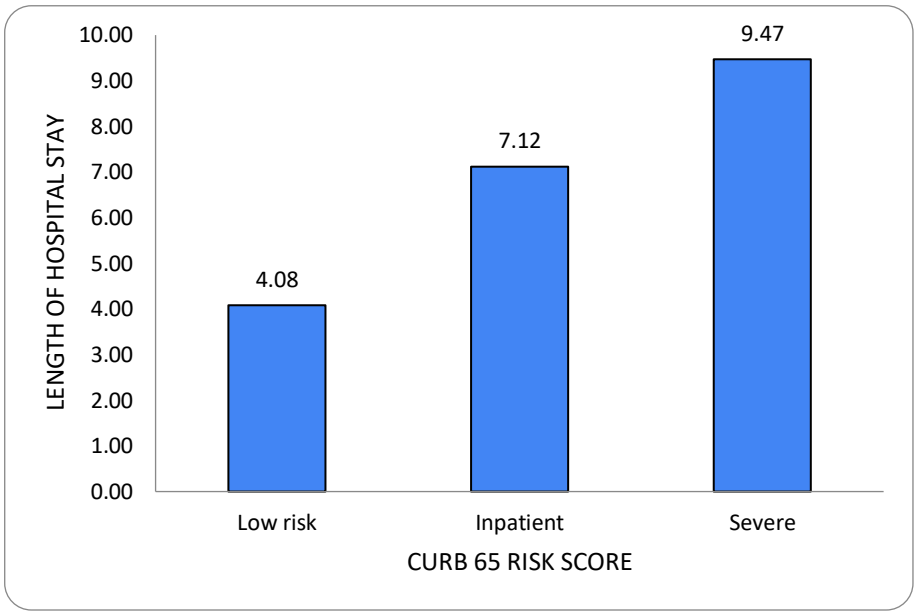
		LENGTH OF HOSPITAL STAY
S.ALB	Pearson Correlation	-0.511
	p value	<0.0001

CURB 65 and length of hospital stay(table 15)

		LENGTH OF HOSPITAL STAY		P value
		Mean	Standard Deviation	
CURB-65	Low risk	4.08	3.71	<0.0001
	Inpatient	7.12	3.33	
	Severe	9.47	4.05	

In curb 65 scoring 0-1, 2, 3-5 are graded as low risk, moderate risk and high risk respectively.

The mean hospital stay among the low risk patients were 4.08 days. Among the intermediate risk group the mean hospital stay was 7.12 days and among the high risk patients the mean hospital stay was 9.47 days.



0-1 LOW RISK

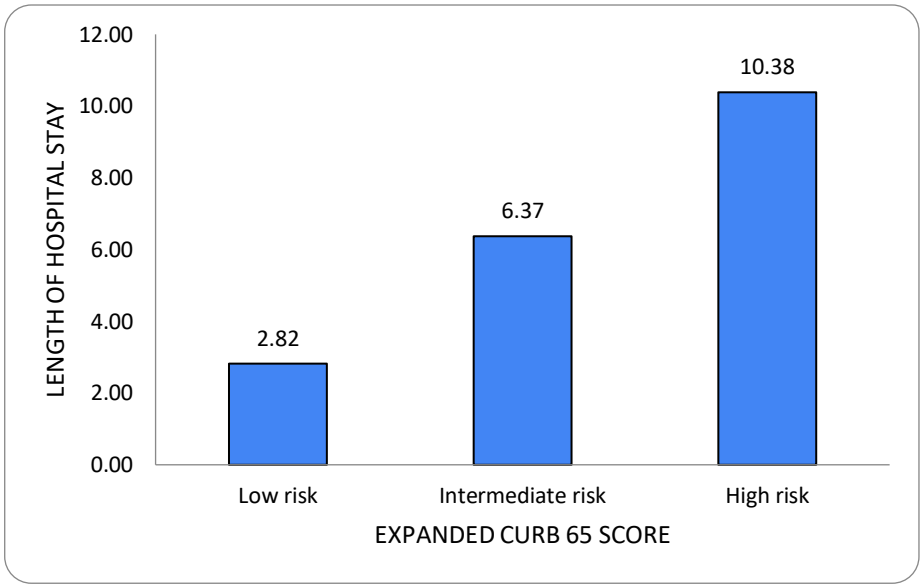
2 MODERATE RISK

3-5 HIGH RISK

Expanded curb 65 and length of hospital stay(table 16)

		LENGTH OF HOSPITAL STAY		P value
		Mean	Standard Deviation	
E-CURB 65	Low risk	2.82	2.49	<0.0001
	Intermediate risk	6.37	2.89	
	High risk	10.38	3.44	

The expanded curb 65 score 0-2, 3-4,5-8 corresponds to low risk, moderate risk and high risk respectively. Among the low risk the mean hospital stay was 2.82 days. Among the intermediate risk patients the mean hospital stay was 6.37 days and 10 days among the high risk patients.



CURB 65 score and mortality correlation (table 17)

		MORTALITY		Total
		YES	NO	
CURB-65	>1.5	9	8	17

	<1.5	7	76	83
Total		16	84	100

CURB 65 score more than 1.5 had a mortality rate of 9 patients compared to those less than 1.5 which had lower mortality rate

E-curb 65 score and mortality correlation(table 18)

		MORTALITY		Total
		YES	NO	
E-CURB 65	>3.5	10	16	26
	<3.5	6	68	74
Total		16	84	100

Expanded curb 65 score less than 3.5 had lesser mortality(6) com

pared to the score more than 3.5(10)

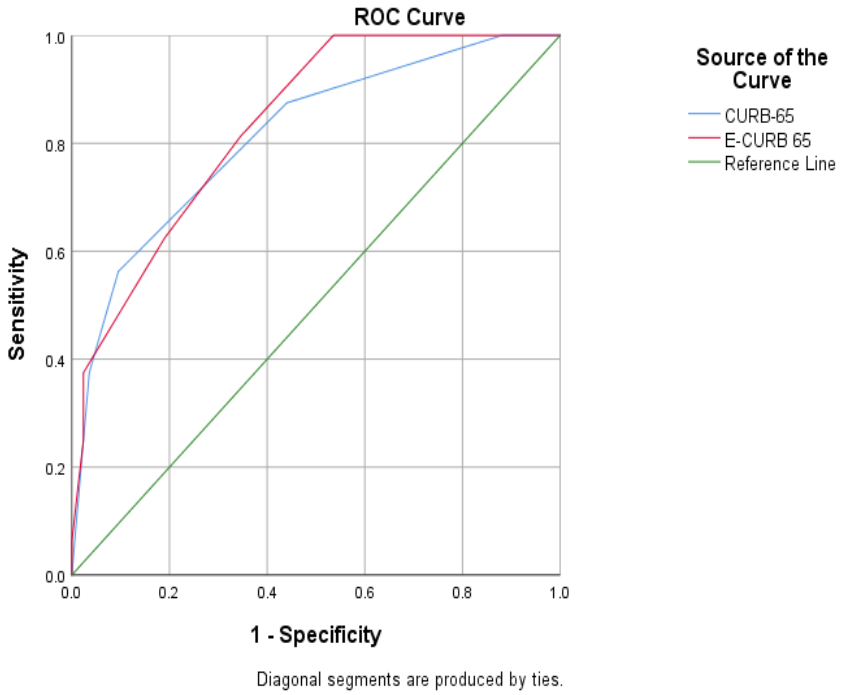


TABLE 19

Mortality	CURB 65	E-CURB 65
Cut off	1.5	3.5
AUC	0.815	0.835
P value	<0.0001	<0.0001
Sensitivity	56.25%	62.50%
Specificity	90.48%	80.95%
PPV	52.94%	38.46%
NPV	91.57%	91.89%
Accuracy	85.00%	78.00%

DISCUSSION

DISCUSSION

The aim of the present study is to compare the prognostic significance of CURB 65 and EXPANDED CURB 65 in community acquired pneumonia patients based on intensive care admission, duration of hospital stay and mortality. In our study the highest incidence of community acquired pneumonia was between 60 to 70 years (33%) followed by 29 % in patients between 50 to 60 years. Patients in their seventh decade had an incidence of 23 %.

Earlier called the friend of old people, the trend is changing with more common in the younger and middle age groups. In our study there was a male preponderance with 61% of males compared to the females 39%.This can be attributed to the higher prevalence of smoking, occupational exposure in males compared to females.

Among those who presented to our hospital , twenty three percentage (23%) of them were confused at admission and remaining 73% were conscious and oriented to time place and person.Confusion, alteration of functional physical capacity, and decompensation of underlying illnesses may appear as unique manifestations. Sixteen percent (16%) of patients presented with hypotension on admission whereas the rest 84% were hemodynamically stable.

Of the 100 patients, 31 patients were admitted in intensive care owing to

respiratory distress and hemodynamic instability. Among them 16 patients went up to receiving mechanical ventilation and overall mortality rate was 14 percent.

The urea, hemoglobin, platelet, serum albumin and serum LDH levels were compared with the mortality rates and correlated accordingly. Among the expired patients the mean hemoglobin was 10.57,the mean urea levels were 20.75,platelet counts were 1,07,125,serum albumin level was 2.85 and serum LDH level was 381.56.Among the alive patients the mean hemoglobin was 10.83,mean urea level was 16,platelet level was above two lakh, serum albumin level was 3.42 and LDH level was 286.From this data it is found that serum albumin levels is a good predictor of mortality in community acquired pneumonia patients(p value<0.002)

In those patients with curb 65 score with low risk, 14.3% patients needed ICU admission whereas those with moderate risk had 35.3% ICU admission rate and those with high risk score had intensive care admission rate of 70.6%.

Applying the expanded curb 65 score for predicting ICU admission, those with low risk had a 7.7% admission rate, those with moderate risk had a admission rate of 28.6% and those with high score had an admission rate of 69.2%. This signifies that CURB 65 and expanded curb 65 had similar role in predicting the admission in intensive care in community acquired pneumonia patients.

Using the CURB 65 score to predict the risk for requiring mechanical ventilation, those with low risk had 8.2 % risk whereas those with moderate risk had 11.8% and those with high risk had a mechanical ventilation rate for 35.3%. Using the expanded curb 65 score to predict the risk of mechanical ventilation, those with low risk did not go for mechanical ventilation. Those with intermediate risk had 17.1% risk for requiring mechanical ventilation and those with high risk had a ventilator requirement rate of 30.8%.From this data there was no significant statistical difference between the curb 65 and expanded curb 65 scores in predicting the mechanical ventilation rate.

Regarding the mortality in community acquired pneumonia patients, curb 65 score was used to predict the mortality. Those with low risk had a mortality rate of 4.1%, those with moderate risk had a mortality risk of 14.7% and those with high risk had a mortality rate of 52.9%.

Comparing the length of hospital stay in both curb 65 and expanded curb 65 score, in curb 65 score those with low risk had a mean stay of 4 days, moderate risk had a mean stay of 7 days and those with high risk had a mean hospital stay of 9 days. Using the expanded curb 65 score, those with low risk had a mean stay of 2 days, those with m6oderate risk had a mean hospital stay of 6 days and those with high risk score had a mean stay of 10 days. From this data analysis, both scores predicted the severity of

infection and was equally found to be useful(p value<0.001)

Comparing curb 65 and expanded curb 65 scores,in terms of mortality the sensitivity was high(62.5%) using expanded curb 65 score in predicting mortality whereas the specificity was higher when calculated using the curb 65 score(90.48%).The positive predictive value of curb 65 and expanded curb 65 was 52.9% and 38.46% respectively in predicting mortality whereas the negative

predictive value was quite higher among the expanded curb65 scores(91.89%)

Regarding serum albumin levels and length of hospital stay there was a positive correlation was significant p value (0.0001) and Pearson correlation (-0.511)

CONCLUSION

CONCLUSION:

- From this study, we can understand that CURB 65 and Expanded CURB 65 has equal prognostic significance.
- Based on the several studies in which expanded curb 65 is superior to curb 65 cannot be confirmed, indeed Expanded CURB 65 has higher sensitivity in identifying high risk patients compared to CURB 65 patients.
- Comparing the specificity, both scores share equal prognostic significance though CURB 65 has higher specificity compared to the other.
- Hence in a resource limited setting, CURB 65 is not inferior to expanded curb 65 and better predicts ICU admission, the need for mechanical ventilation and mortality rate.
- Of the biochemical parameters, serum albumin better predicts the length of hospital stay and the course of illness. Hence albumin can be used even in secondary and primary health centers to predict the mortality.
- From this study the curb 65, an inexpensive tool is a time tested score and can be better used to assess community acquired pneumonia patients.

LIMITATIONS:

- Because of time and money restrictions, the sample size was modest.

- Only patients admitted to one tertiary care facility participated in the study.

- This study was limited to hospitalised patients with CAP, making it impossible to draw conclusions about its applicability to those who would benefit from outpatient therapy.

- These individuals did not receive long-term monitoring, hence the time frame for serum albumin normalization could not be determined.

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PROFORMA

Following details will be collected from the patient's IP record

A COMPARATIVE STUDY OF THE PROGNOSTIC SIGNIFICANCE OF CURB65 AND EXPANDED CURB 65 IN COMMUNITY ACQUIRED PNEUMONIA PATIENTS

DEMOGRAPHIC DATA

1. NAME
2. AGE
3. SEX
4. IP NO
5. OCCUPATION
6. ADDICTIONS

CHIEF COMPLAINTS

1. COUGH
2. BREATHLESSNESS
3. FEVER
4. CHEST PAIN

VITAL SIGNS AT ADMISSION

1. PULSE
2. BLOOD PRESSURE
3. RESPIRATORY RATE

COMORBID ILLNESS:

1. DIABETIC :
2. CORONARY ARTERY DISEASE :
3. KIDNEY DISEASE :
4. LIVER DISEASE :
5. IMMUNOSUPPRESANTS :
6. PREGNANCY/LACTATION
7. HIV

INVESTIGATIONS:

1. Hb :
2. PLATELETS :
3. SERUM ALBUMIN :
4. SERUM LDH :
5. CHEST X RAY ON ADMISSION

CURB -65 SCORE

1. AGE :
2. CONFUSION :
3. BLOOD UREA :
4. RESPIRATORY RATE :
5. BLOOD PRESSURE :
6. TOTAL SCORE

   (0-2 low risk-home treatment

   2 in patient

   3-5 manage as severe)

EXPANDED CURB 65 SCORE

9. AGE :
10. CONFUSION :
11. BLOOD UREA :
12. RESPIRATORY RATE :
13. BLOOD PRESSURE :

14. SERUM ALBUMIN :

15. SERUM LDH :

16. PLATELET COUNT :

(0-3 low risk

3-4 intermediate risk

5 -8 high risk)

1. LENGTH OF HOSPITAL STAY : days
2. IMCU CARE : yes/no
3. MECHANICAL VENTILATIION : yes/no
4. DEATH

GOVERNMENT KILPAUK MEDICAL COLLEGE,

INSTITUTIONAL ETHICS COMMITTEE

Reg.No. ECR/1385/Inst/TN/2020

CERTIFICATE OF APPROVAL

IEC PROTOCOL NO	: **902/2022**
TITLE OF THE STUDY	: A COMPARATIVE STUDY OF THE PROGNOSTIC SIGNIFICANCE OF CURB65 AND EXPANDED CURB 65 IN COMMUNITY ACQUIRED PNEUMONIA PATIENTS
PRINCIPAL INVESTIGATOR	: DR. MESHACH J
DESIGNATION	: MD POST GRADUATE
DEPARTMENT:	: DEPT OF GENERAL MEDICINE GOVT. KILPAUK MEDICAL COLLEGE, CHENNAI-10.

The request for an approval from the Institutional Ethics Committee (IEC) was considered on the IEC meeting held on **08/04/2022** at Government Kilpauk Medical College, Chennai-10.

The members of the Committee, the secretary and the Chairman are pleased to inform that the proposed work mentioned above, submitted by the principal Investigator is **APPROVED.**

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, 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 regulations of the Institution(s)
5) You should complete the work within the specific 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

Institutional Ethics Committee,
Kilpauk Medical College,Chennai.

Member Secretary
Institutional Ethics Committee,
Govt. Kilpauk Medical College,
Chennai - 600010

DME(OSD)/DEAN

Kilpauk Medical College,
Chennai.

PATIENT CONSENT FORM

Study Title: A COMPARATIVE STUDY OF THE PROGNOSTIC SIGNIFICANCE OF CURB65 AND EXPANDED CURB 65 IN COMMUNITY ACQUIRED PNEUMONIA PATIENTS.

Study Centre : GOVERNMENT ROYAPETTAH HOSPITAL

Patient Name :

Patient Age and Sex :

Patient IP no :

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

I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving reason, without my legal rights being affected.

I understand that sponsor of the clinical study, others working on the sponsor's behalf, the ethical committee and the regulatory authorities will not need my permission to look at my health records, both in respect of current study and any further research that may be conducted in relation to it, even if I withdraw from the study I agree to this access. However, 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 this study.

I agree to take part in the above study and to comply with the instructions given during the study and faithfully cooperate with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or well-being or any unexpected or unusual symptoms.

I hereby consent to participate in this study.

I hereby give permission to undergo complete clinical examination and diagnostic tests including hematological, biochemical, radiological tests.

Signature/thumb impression:

Patients Name and Address:

Signature of investigator:

Study investigator’s Name: place date

MASTER CHART

NAME	AGE	SEX	IPNO	PULSE	BP	RR	BUN	CONFUS	HB	PLT	S.ALB	S.LDH	CURB-65	E-CURB	LENGTH	mechanic	ICU admi	DEATh
Raju	65	1	2345	102	110/70	14	12	No	11.8	143000	3.5	124	1	1	10	no	no	2
Ashok	68	1	2456	108	120/80	24	14	no	12	120000	3.8	155	1	1	7	no	no	2
Kannapp	**48**	**1**	**2356**	**124**	**80/60**	**32**	**13**	**no**	**11.9**	**76000**	**2.5**	**450**	**2**	**5**	**15**	**yes**	**no**	**1**
Saroja	70	2	2567	112	110/70	20	18	No	10.8	250000	3.4	245	1	3	8	no	no	2
senthil ku	46	1	2890	98	120/80	15	15	yes	11	45000	3.2	267	1	4	9	no	no	2
rajesh	67	1	2134	86	140/90	18	16	No	11.7	125000	2.5	450	1	3	5	no	no	2
Dinesh	63	1	2245	78	130/80	28	23	no	10.6	68000	3.9	135	1	2	0	n0	no	2
raghuva	**56**	**1**	**2543**	**102**	**80/60**	**35**	**45**	**yes**	**8.9**	**98000**	**2.9**	**458**	**3**	**6**	**15**	**yes**	**yes**	**1**
Lakshmi	68	2	2145	78	100/60	19	23	yes	9.3	230000	3.3	120	2	3	4	no	no	2
guhan	67	1	3254	76	110/70	25	13	no	10.2	167000	3.3	440	1	4	7	no	no	2
haris	45	1	2456	78	130/80	28	14	no	12.1	450000	3.9	320	1	2	0	no	no	2
gukesh	**78**	**1**	**2425**	**104**	**60/40**	**32**	**16**	**yes**	**11.6**	**100000**	**2.6**	**560**	**5**	**7**	**13**	**yes**	**yes**	**1**
lakshmar	55	1	1980	110	120/80	35	12	yes	11.6	87000	2.9	360	1	4	6	no	no	2
maria ros	68	2	1998	132	110/70	32	14	no	9.3	56000	2.4	110	2	4	6	no	yes	2
relton	**58**	**1**	**1999**	**122**	**120/80**	**32**	**21**	**yes**	**9.3**	**100000**	**2.5**	**255**	**1**	**4**	**6**	**no**	**yes**	**2**
Lawrence	66	1	2134	88	120/90	23	12	no	10.5	18000	3.6	550	1	3	7	no	no	2
thiagu	87	1	2136	98	110/60	33	21	no	11.9	98000	2.3	540	2	5	15	yes	yes	1
meenaks	55	2	2156	122	130/90	35	11	yes	10.5	110000	3.7	198	2	2	3	no	no	2
rajalaksl	**68**	**2**	**2451**	**142**	**160/100**	**38**	**15**	**No**	**8.5**	**76000**	**2.8**	**450**	**2**	**5**	**8**	**no**	**no**	**2**
rajarajan	65	2	2321	112	140/90	21	12	no	11.2	350000	3.5	100	1	1	0	no	no	2
dhanalak	36	2	2113	14	130/80	33	14	no	8.9	450000	4.3	250	1	2	0	no	no	2
harikrish	**90**	**1**	**2331**	**110**	**90/60**	**28**	**16**	**yes**	**10.9**	**90000**	**2.5**	**330**	**2**	**5**	**10**	**no**	**yes**	**2**
muthuku	87	1	2221	116	110/70	35	14	no	8.9	39000	3.8	440	2	4	6	no	no	2
jayaraj	55	1	2331	124	120/80	36	17	no	11.3	230000	2.8	214	1	2	4	no	no	2
arogyam	**87**	**2**	**2331**	**124**	**80/60**	**30**	**19**	**n0**	**6.3**	**90000**	**3**	**670**	**4**	**7**	**16**	**no**	**yes**	**2**
indhrani	77	2	2446	135	100/60	28	23	no	12.3	66000	3.3	125	2	4	7	no	no	2
uma mah	55	2	3211	110	110/60	31	20	no	11.4	55000	2.2	332	2	5	10	no	yes	2
urvasi	49	2	2335	132	110/70	35	15	yes	9	340000	4.8	550	2	3	4	no	no	2
Bose	66	1	2336	98	130/80	32	22	no	9.5	210000	3.9	220	2	2	4	no	no	2
Rajan	57	1	2558	122	120/80	34	13	no	11.5	89000	3.5	330	0	2	5	no	yes	2
gowri	59	2	2667	88	110/70	28	12	no	10.4	230000	3.6	155	0	0	0	no	no	2
devaraj	66	1	2776	123	140/90	33	16	no	12.3	344000	4.6	330	2	2	3	no	no	2
kalavathy	68	2	2546	112	80/60	24	13	no	11.4	77000	2.9	220	2	5	6	no	yes	2
rajasekh	**55**	**1**	**2354**	**122**	**110/70**	**38**	**18**	**yes**	**13.3**	**88000**	**2.5**	**553**	**2**	**5**	**6**	**no**	**no**	**2**
deepthy	39	2	3261	102	100/60	30	14	no	9.6	450000	3.9	220	1	1	3	no	no	2
lokeshwa	56	1	2341	123	120/80	45	12	no	11.2	230000	3.3	220	1	2	2	no	no	2
gokulnatl	66	1	2229	102	110/70	44	16	yes	12.3	125000	4.2	123	3	3	7	no	yes	2
keerthan	55	2	2121	98	100/70	33	14	no	11.7	350000	3.3	550	1	3	0	no	no	2
ansar be	**73**	**2**	**2332**	**133**	**130/80**	**35**	**24**	**yes**	**6.3**	**88000**	**2.1**	**455**	**4**	**7**	**9**	**yes**	**yes**	**1**
gurupras	56	1	3212	112	110/70	32	13	no	11.5	532000	3.6	233	1	2	3	no	no	2
hemanth	**77**	**1**	**2342**	**122**	**80/60**	**35**	**38**	**yes**	**12.8**	**45000**	**2.8**	**544**	**5**	**8**	**15**	**no**	**yes**	**1**
kalaivani	56	2	1245	65	120/80	22	22	no	11.9	198000	3.3	333	1	3	5	no	no	2
thulasi	64	2	1234	88	110/70	31	16	no	8.8	134000	4	211	1	1	4	no	no	2
jacob	73	1	2412	124	150/90	29	14	no	12.3	34500	2.9	242	1	4	8	no	yes	2
punithku	57	1	4534	66	130/80	28	16	no	11	432000	4.2	110	0	0	0	no	no	2
arumuga	77	1	5653	82	90/70	25	21	no	13	88000	2.6	432	2	5	7	no	yes	1
annamal	67	1	34443	95	120/70	33	22	no	8.9	250000	3.7	211	3	3	5	no	no	1
gandhi	**73**	**2**	**3724**	**112**	**120/80**	**35**	**18**	**yes**	**10.8**	**99000**	**2.9**	**466**	**3**	**5**	**6**	**no**	**no**	**2**
panchav	65	2	3446	134	130/90	33	22	yes	12.3	150000	3.6	222	4	4	6	no	yes	1
cholan	55	1	3545	122	110/70	28	16	no	13.3	230000	3.5	232	0	1	3	no	no	2
rajendrar	66	1	3454	132	120/80	33	22	no	11.5	320000	4.5	343	3	4	5	no	no	2

neelakan	59	1	4567	88	110/70	28	12	no	10.4	230000	3.6	155	0	0	0	no	no	2
neelaven	66	2	6654	123	140/90	33	16	no	12.3	344000	4.6	330	2	2	3	no	no	2
rithvika	68	2	4456	112	80/60	24	13	no	11.4	77000	2.9	220	2	5	6	no	yes	2
umar	**55**	1	5543	**122**	**110/70**	**38**	**18**	**yes**	**13.3**	**88000**	**2.5**	**553**	**2**	**5**	**15**	**no**	**no**	**2**
mohame	39	1	4456	102	100/60	30	14	no	9.6	450000	3.9	220	1	1	3	no	no	2
imthiaz al	56	1	5543	123	120/80	45	12	no	11.2	230000	3.3	220	1	2	2	no	no	2
feroz sha	66	1	7765	102	110/70	44	16	yes	12.3	125000	4.2	123	3	3	7	no	yes	2
ramya	55	2	7777	98	100/70	33	14	no	11.7	350000	3.3	550	1	3	0	no	no	2
robin	**55**	1	2123	122	100/70	35	14	no	12.3	99000	3.3	450	1	4	12	yes	no	2
sheethal	48	2	4564	124	110/70	28	16	no	11.1	78000	2.9	550	**0**	**3**	15	yes	no	2
halen	**57**	1	5654	132	120/80	33	18	no	12.4	145000	3.8	330	**1**	**2**	0	no	no	2
david	66	1	6675	66	80/60	35	22	yes	13.3	450000	3.6	210	**4**	**4**	6	yes	yes	1
rajasekar	**76**	1	7876	144	110/70	32	18	no	11	33000	3.3	550	**2**	**5**	9	yes	no	2
gowrisha	78	1	8965	122	70/40	36	45	yes	14	320000	3.7	210	**5**	**5**	9	yes	yes	2
feroz sha	**54**	1	8655	122	110/60	33	14	no	8.8	530000	2.3	333	**1**	**3**	9	no	no	2
subash	66	1	6654	144	120/80	28	15	yes	6.5	220000	3.9	210	**2**	**2**	7	no	no	2
ravinder	**77**	1	6786	132	60/40	33	13	no	5.9	88000	2.3	370	**3**	**6**	11	yes	no	1
kalaiselvi	**65**	2	6686	116	110/70	30	24	no	13.3	167000	3.5	112	**3**	**3**	6	no	no	2
fathima	**63**	2	7856	122	100/70	36	11	yes	11.3	22000	2.6	155	**1**	**4**	10	yes	no	1

													curb 65		E curb 65			1-death
		1-male											**0-1 low risk**		**0-2 low risk**			2-no dea
		2-female											**2- in patient**		**3-4 intermediate risk**			
													3-5 severe		**5-8 high risk**			

lokeshwa	56	1	2341	123	120/80	45	12	no	11.2	230000	3.3	220	1	2	2	no	no	2
gokulnatl	66	1	2229	102	110/70	44	16	yes	12.3	125000	4.2	123	3	3	7	no	yes	2
keerthan	55	2	2121	98	100/70	33	14	no	11.7	350000	3.3	550	1	3	0	no	no	2
ansar bc	**73**	**2**	**2332**	**133**	**130/80**	**35**	**24**	**yes**	**6.3**	**88000**	**2.1**	**455**	**4**	**7**	**9**	**yes**	**yes**	**1**
gurupras	56	1	3212	112	110/70	32	13	no	11.5	532000	3.6	233	1	2	3	no	no	2
hemanth	**77**	**1**	**2342**	**122**	**80/60**	**35**	**38**	**yes**	**12.8**	**45000**	**2.8**	**544**	**5**	**8**	**15**	**no**	**yes**	**1**
kalaivani	56	2	1245	65	120/80	22	22	no	11.9	198000	3.3	333	1	3	5	no	no	2
thulasi	64	2	1234	88	110/70	31	16	no	8.8	134000	4	211	1	1	4	no	no	2
jacob	73	1	2412	124	150/90	29	14	no	12.3	34500	2.9	242	1	4	8	no	yes	2
punithkur	57	1	4534	66	130/80	28	16	no	11	432000	4.2	110	0	0	0	no	no	2
arumuga	77	1	5653	82	90/70	25	21	no	13	88000	2.6	432	2	5	7	no	yes	1
annamal	67	1	34443	95	120/70	33	22	no	8.9	250000	3.7	211	3	3	5	no	no	1
gandhi	**73**	**2**	**3724**	**112**	**120/80**	**35**	**18**	**yes**	**10.8**	**99000**	**2.9**	**466**	**3**	**5**	**6**	**no**	**no**	**2**
panchavi	65	2	3446	134	130/90	33	22	yes	12.3	150000	3.6	222	4	4	6	no	yes	1
cholan	55	1	3545	122	110/70	28	16	no	13.3	230000	3.5	232	0	1	3	no	no	2
rajendrar	66	1	3454	132	120/80	33	22	no	11.5	320000	4.5	343	3	4	5	no	no	2
krishnasv	47	1	8767	143	130/90	28	18	no	12.4	245000	4.7	220	0	0	0	no	no	2
lalitha	**88**	**2**	**8785**	**122**	**110/70**	**35**	**17**	**no**	**11.3**	**67000**	**3.6**	**150**	**2**	**3**	**9**	**yes**	**yes**	**1**
radha	49	2	2343	58	130/90	22	11	no	6.5	540000	3.3	245	0	2	5	no	yes	2
lokamma	66	2	2256	88	110/70	26	14	no	11.5	410000	2.4	66	1	2	4	no	no	2
peter	**78**	**1**	**6543**	**48**	**90/60**	**37**	**22**	**yes**	**11.1**	**37000**	**2.1**	**456**	**4**	**7**	**9**	**no**	**yes**	**1**
raju	**54**	**1**	**6567**	**122**	**120/60**	**32**	**13**	**no**	**8.8**	**323000**	**3.7**	**143**	**1**	**1**	**3**	**no**	**no**	**2**
lingam	79	1	3345	66	110/70	28	11	yes	12.2	45700	2.5	333	2	5	8	no	yes	2
karthik	45	1	2234	88	130/80	27	13	no	10	220000	3.6	112	1	1	0	no	no	2
feroze	67	1	2345	98	110/70	26	14	no	11.4	323000	3	221	1	2	3	no	no	2
gunaseka	56	1	5456	69	140/90	25	16	no	12.3	65000	4.4	321	1	3	5	no	yes	2
freeda	45	2	6567	66	120/80	15	14	yes	14.4	320000	3.3	112	1	2	4	no	no	2
menaka	**66**	**2**	**6544**	**56**	**110/70**	**36**	**18**	**no**	**9.7**	**467000**	**2.3**	**89**	**2**	**3**	**2**	**no**	**no**	**2**
gopal	**77**	**1**	**6555**	**88**	**90/60**	**33**	**12**	**no**	**8.7**	**23000**	**3.1**	**670**	**2**	**5**	**8**	**no**	**yes**	**1**
robert	55	1	4543	54	110/60	26	14	no	9.9	56000	3	332	1	4	5	no	no	2
emilna	48	2	3432	65	100/60	25	13	no	14.2	78000	3.5	212	0	1	0	no	no	2
muthula	**54**	**2**	**5456**	**78**	**110/70**	**28**	**25**	**yes**	**13.5**	**230000**	**4.5**	**44**	**2**	**2**	**6**	**no**	**no**	**2**
suganthy	66	2	4567	87	120/80	**26**	13	no	9.9	34000	3.2	**222**	1	3	9	yes	yes	1
jamila	76	1	6543	66	130/90	**33**	12	no	7.6	233000	4.3	**190**	2	2	6	no	no	2
moorthy	**68**	1	4345	**142**	**160/100**	**38**	**15**	**No**	**8.5**	**76000**	**2.8**	**450**	**2**	**5**	**8**	**no**	**no**	**2**
sathyase	65	1	3232	112	140/90	21	12	no	11.2	350000	3.5	100	1	1	0	no	no	2
jeyaseela	36	1	2123	14	130/80	33	14	no	8.9	450000	4.3	250	1	2	0	no	no	2
hariharar	**90**	1	4566	**110**	**90/60**	**28**	**16**	**yes**	**10.9**	**90000**	**2.5**	**330**	**2**	**5**	**10**	**no**	**yes**	**2**
rajeshwa	87	**2**	**3323**	116	110/70	35	14	no	8.9	39000	3.8	440	2	4	6	no	no	2
kishore	55	1	2367	124	120/80	36	17	no	11.3	230000	2.8	214	1	2	4	no	no	2
john	**87**	1	8789	**124**	**80/60**	**30**	**19**	**n0**	**6.3**	**90000**	**3**	**670**	**4**	**7**	**16**	**no**	**yes**	**2**
sheela	77	2	5456	135	100/60	28	23	no	12.3	66000	3.3	125	2	4	7	no	no	2
rajam	55	2	3445	110	110/60	31	20	no	11.4	55000	2.2	332	2	5	10	no	yes	2
lily	49	2	6545	132	110/70	35	15	yes	9	340000	4.8	550	2	3	4	no	no	2
jones	66	1	4543	98	130/80	32	22	no	9.5	210000	3.9	220	2	2	4	no	no	2
parvathy	57	2	5456	122	120/80	34	13	no	11.5	89000	3.5	330	0	2	5	no	yes	2