A Dissertation on

ORGANISMS PROFILE CULTURE AND SENSITIVITY PATTERN IN PATIENTS ADMITTED IN PEDIATRIC INTENSIVE CARE UNIT

Dissertation submitted in

Partial fulfillment of the regulations for the award of the degree of

M.D. PEDIATRIC MEDICINE

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CERTIFICATE

Certified that this dissertation entitled "**ORGANISMS PROFILE CULTURE AND SENSITIVITY PATTERN IN PATIENTS ADMITTED IN PEDIATRIC INTENSIVE CARE UNIT" is a bonafide work done by Dr. MENAKA.P, M.D Post graduate student of Pediatric Medicine, Coimbatore Medical College & Hospital, Coimbatore- 641 018 during the academic year 2015-2018.**

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DECLARATION

I declare that this dissertation entitled **"ORGANISMS PROFILE CULTURE AND SENSITIVITY PATTERN IN PATIENTS ADMITTED IN PEDIATRIC INTENSIVE CARE UNIT"** has been conducted by me at PICU, Department of Pediatrics, Coimbatore Medical College and Hospital, under the guidance and supervision of my guide **Prof. Dr. V.SUGANTHI MD.DCH**. It is submitted in part of fulfillment of the award of the degree of M.D Pediatrics for the MAY 2018 examination to be held under The Tamil Nadu Dr. M.G.R Medical University, Chennai. This has not been submitted previously by me for the award of any degree or diploma from any other university.

[Dr. MENAKA.P]

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[Dr. MENAKA.P]

ABBREVIATIONS

S. aureus	-	Staphylococcus aureus
S. pneumoniae	-	Streptococcus pneumoniae
H. influenzae	-	Haemophilus influenzae
K. pneumoniae	-	Klebsiella pneumoniae
M.pneumoniae	-	Mycoplasma pneumoniae
L. monocytogenes	-	Listeria monocytogenes
P. aeruginosa	-	Pseudomonas aeruginosa
E.coli	-	Escherichia coli
P. mirabilis	-	Proteus mirabilis
CSF	-	Cerebrospinal fluid
PCR	-	Polymerase Chain Reaction
CT	-	Computerised Tomography
MRI	-	Magnetic Resonance Imaging

ANTIBIOTIC KEY

Amx	–	Amoxycillin
Amp	–	Ampicillin
Ak	–	Amikacin
CN	–	Cephelexin
Ctx	–	Cefotaxime
Lz	–	Linezolid
Of	–	Ofloxacin
P	–	Penicillin
Amc	–	Amoxycillin + Clavulanic acid
Mrp	–	Meropenam
Nit	–	Nitrofurantoin
Ctz	–	Ceftazidime
Ctr	–	Ceftriaxone
Cip	–	Ciprofloxacin
Cot	–	Cotrimoxazole
Do	–	Doxycycline
E	–	Erythromycin
Gen	–	Gentamycin
Nx	–	Norfloxacin
Tob	–	Tobramycin
Cfs	–	Cefaperazone+ Sulbactum

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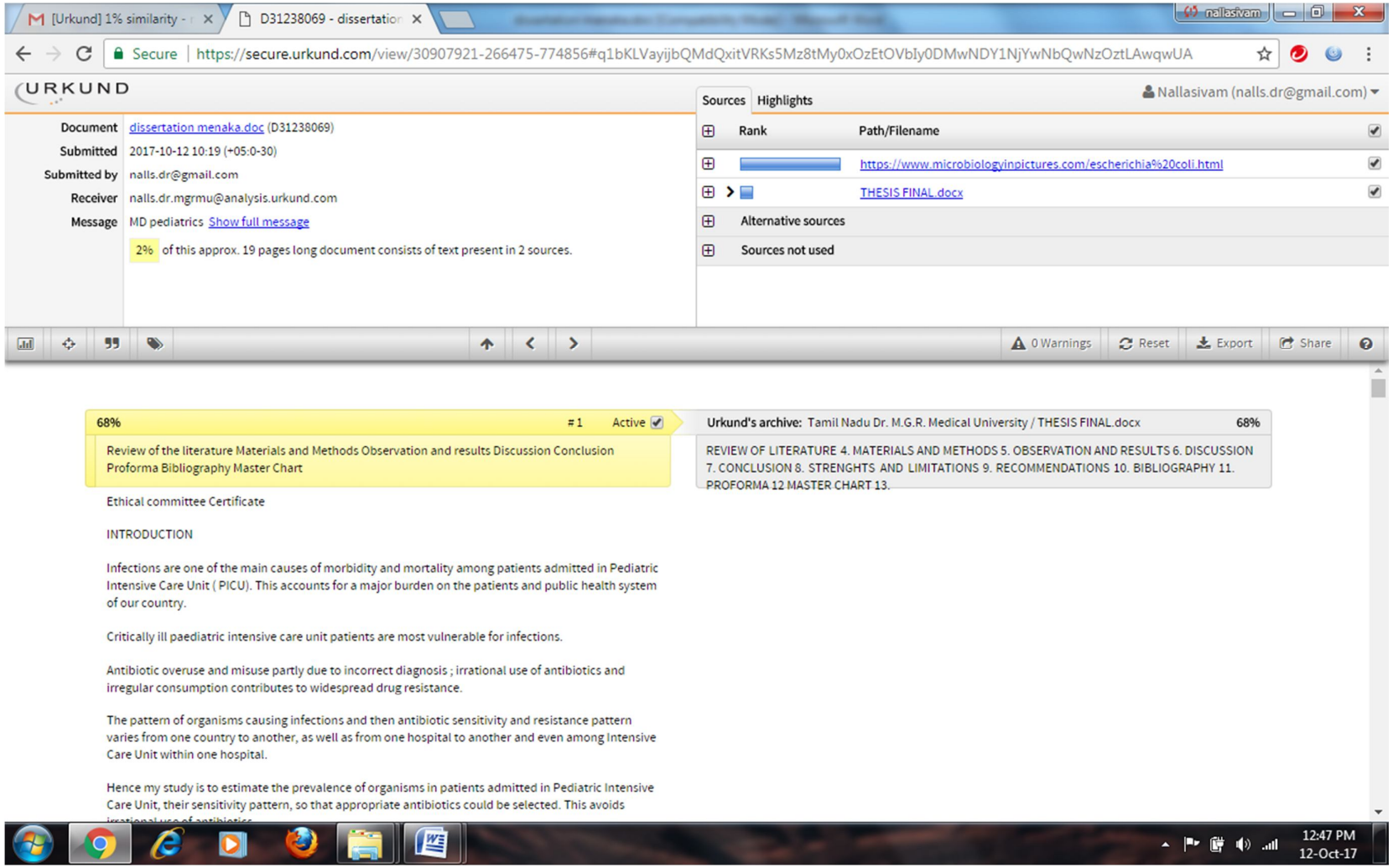
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INTRODUCTION
Infections are one of the main causes of morbidity and mortality among patients admitted in Pediatric Intensive Care Unit (PICU). This accounts for a major burden on the patients and public health system of our country.
Critically ill paediatric intensive care unit patients are most vulnerable for infections.
Antibiotic overuse and misuse partly due to incorrect diagnosis ; irrational use of antibiotics and irregular consumption contributes to widespread drug resistance.
The pattern of organisms causing infections and then antibiotic sensitivity and resistance pattern varies from one country to another, as well as from one hospital to another and even among Intensive Care Unit within one hospital.
Hence my study is to estimate the prevalence of organisms in patients admitted in Pediatric Intensive Care Unit, their sensitivity pattern, so that appropriate antibiotics could be selected. This avoids
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TABLE OF CONTENTS

INTRODUCTION

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AIMS OF THE STUDY

The aim of the study is

i) To estimate the prevalence of organisms in patients admitted in Pediatric Intensive Care Unit (PICU) in Coimbatore Medical College Hospital.

ii) To estimate the culture and sensitivity pattern of the organisms.

REVIEW OF THE LITERATURE

Infection has been prime concern of human beings for a long period. Control of infection has a long historical background. There were much improvements in this field since ancient times. In twentieth century immunization and development of antibiotics has made a tremendous change. But on the other hand improper usage and inappropriate antibiotics has led to the development of multi drug resistant organisms.

Identification of the organism , their culture and sensitivity pattern and appropriate antibiotic usage is the need of the hour.

Respiratory system:-

Pneumonia:-

Acute respiratory infections are the leading cause of under five childhood mortality as per World Health Organisation documents[1,2]. A few proportion of children suffer from pneumonia leading to respiratory distress. If treatment is not given early, they become severe and life threatening. About 20% of childhood deaths are due to pneumonia. Under five age group are more commonly affected. For every single child death

in a developed country, more than two hundred children die of pneumonia in the developing countries[3]. Every year four million deaths occur due to pneumonia. Half of them are children under five[4]. Only about fifty percent access to medical care. Of them only twenty percent are treated with antibiotics[5]. The median global incidence of pneumonia is 0.28 episodes per child year[6].

Inflammation of the lung parenchyma is called as Pneumonia. The leading cause of death worldwide in children less than 5 years of age.

The incidence of pneumonia is ten times higher (0.29 episodes vs 0.03 episodes) and the number deaths from pneumonia is 2000 times higher in developing than in developed countries.

There is a decline in incidence nowadays. It is because of introduction of antibiotics and vaccines. Introduction of Haemophilus influenzae type b vaccine and Pneumococcal vaccine has reduced the mortality due to pneumonia. Pneumonia can be prevented by immunization, adequate nutrition and by addressing environmental factors.

Improved access to healthcare in rural areas of developing countries and the introduction of pneumococcal conjugate vaccines were also important contributions to the further reduction in pneumonia related deaths achieved over past decade.

Etiologic Agents grouped by age of the patient

Age Group	**Frequent pathogens**
Neonates < 3 weeks	Group B streptococcus, Escherichia coli, Other Gram – ve bacilli, streptococcus pneumoniae, Haemophilus influenzae type b
3 weeks – 3 months	Respiratory Syncytial Virus, other respiratory viruses (Rhinoviruses, parainfluenza viruses, influenza viruses, adenovirus), Streptococcus pneumoniae, Haemophilus influenzae, Chlamydia trachomatis
4 months – 4 years	Respiratory Syncytial Virus, (Rhinovirus, parainfluenza virus, adenovirus), S. pneumoniae, H. influenzae, M.pneumoniae, Group A streptococcus.
More than 5 yrs	M. pneumoniae, S. pneumoniae, Chlamydia pneumoniae, H.influenzae, Influenza virus, Adenovirus, other respiratory viruses, Legionella pneumophila

The basic mechanisms behind pneumonia are

i) By inhalation of virulent agent from upper airways.

ii) Spread from neighbouring sites.

iii) Inhalation of contaminated droplets.

iv) Secondary invasion when the defence mechanism is affected.

v) Via blood stream.

Risk factors for pneumonia may be classified as host factors and environmental factors.

Host factors :-

- Young age
- Male > female
- Lack of breast feeding
- Immunodeficiency
- Congenital heart disease
- Illness like measles

Environmental factors :-

- Family size
- Crowding
- Parental smoking
- Air pollution
- Bad child rearing practices

Pneumonia is classified into different types

Based on etiology

- Bacterial
- Viral
- Protozoal
- Miscellaneous

Based on anatomy

- Lobar pneumonia

  One or more of the lobes of the lung involved

- Bronchopneumonia

  Patchy involvement of the whole lung

- Interstitial pneumonia

  Alveoli or interstitial tissue between them are affected.

Based on acquisition.

- Congenital pneumonia
- Community acquired pneumonia
- Hospital acquired pneumonia

Based on chronicity

- Acute pneumonia
- Chronic /recurrent /persistent pneumonia

WHO classification.

- No pneumonia
- Pneumonia
- Severe Pneumonia
- Very severe pneumonia

In the IBIS study in vellore streptococcus pneumoniae was isolated in 15 out of 285(5.5%) and Haemophilus influenzae in 4 out of 285 (1.4%) in children under 5years age group[7].

In KABRA studies 5% shows streptococcus pneumoniae, 24% shows Mycoplasma but no growth of Haemophilus influenzae[8].

In SINHA et al. and Jayanth Prakash et al. study there were 6% streptococcus pneumoniae and 17% H. influenzae[9].

Studies in USA by Ian C Michelow et al. 60% of the samples were positive of which 73% was streptococcus pneumoniae[10].

Pneumonia is characterized by following four stages.

i) First stage

Stage of congestion. It occurs within 24 hours of infection. There is vascular congestion and alveolar edema.

ii) Second stage

Stage of Red hepatization. It is characterized by the presence of many erythrocytes, neutrophils, desquamated epithelial cells and fibrin.

iii) Third stage

Stage of Grey hepatization. The lung is Grey brown to yellow. It is because of the fibrino purulent exudates. There is disintegration of red cells and hemosiderin.

iv) Fourth stage

Stage of Resolution. It is characterized by resorption of the exudates. Resolution or organization with pleural adhesions may follow.

Community acquired pneumonia is caused by pathogens acquired in the community (outside the hospital setting). Hospital acquired pneumonia is that which develops 48hrs after admission. Community acquired pneumonia responds more to antibiotics than hospital acquired pneumonia.

In the study conducted in PGI Chandigarh children aged 3- 51 months with severe Community Acquired Pneumonia, most common organisms isolated from nasopharyngeal specimens were Streptococcus pneumoniae and Respiratory syncytial Virus.

Streptococcus pneumoniae and Haemophilus influenza shows 100% susceptibility to Ampicillin, Erythromycin, Cefotaxime & Ciprofloxacin.

Nasopharyngeal cultures for bacterial pathogens were positive for Streptococcus pneumoniae and Haemophilus influenze in a study by Rakesh Lodha et. al[11,12].

In a study by James John et. al, 44 % isolates of Streptococcus pneumoniae were resistant to trimethoprim/ sulphamethoxazole[13].

Nisarga et.al found Pneumococcus being most resistant against the antibiotics trimethoprim /sulfamethoxazole[14].

The highest estimated incidence rate was observed in children aged 6-12 months, 20 blood samples, 29 CSF samples & 13 pleural fluid samples were positive for Streptococcus pneumoniae. The rate of positive growth in blood, CSF and pleural fluid was 7.3%. 20% and 46.7% (Nisarga et.al)[14].

Bacterial pneumonia can occur either by direct spread of the organism or via the blood stream.

Streptococcus pneumoniae causes local edema and spreads to adjacent areas. It usually causes lobar involvement.

Staphylococcus aureus causes hemorrhagic necrosis, cavitation. It leads to pneumatoceles, empyema and fistulas.

Mycoplasma pneumoniae invades the respiratory epithelium, inhibits the action of cilia and causes destruction of cells.

The patient presents with fever, cough, difficulty in breathing.

Clinical examination findings include tachypnoea increased work of breathing and crepitations.

The factors which influence the etiological organisms are

Age of the child

Immunisation status

Whether community or hospital acquired

Seasonality

Risk factors like cystic fibrosis

Diagnosis is by blood counts and chest X ray. Definitive diagnosis is by isolation of organisms.

Treatment includes third generation cephalosporins like Cefotaxime and Ceftriaxone. If Staphylococcal pneumonia suspected Vancomycin or Clindamycin is to be added. For mycoplasma pneumonia macrolide antibiotics like Azithromycin is to be given. Antibiotics should be continued for 7 to 10 days in uncomplicated pneumonia.

The complications of pneumonia are pleural effusion, empyema, pneumatocele, bronchiectasis, lung abscess, collapse, subcutaneous emphysema, pneumothorax, metastatic spread to other sites like meningitis, septic arthritis and osteomyelitis.

General measures like good nursing care, bed rest, oxygen, adequate fluids , dietary intake, breathing exercises should be taken care of.

Poor prognostic signs are young age, immunodeficiency, poor nutritional status, complications like congestive cardiac failure. If appropriate and timely treatment is available prognosis is good. Preventive measures include breast feeding[15], vaccination, good nutritional status, better living conditions and reduction of air pollution.

Empyema:

Empyema thoracis is a Latin word. It means pus in pleural space. This earliest description and its surgical management was done by Hippocrates[16]. By 19 th century Pleural aspiration, Under water seal drainage and surgery were all practised . In developing countries like India it still remains a major problem.

About 40% of pneumonias progress to effusions and sixty percent of the effusions results in empyema[17]. Though the incidence of empyema is low it remains the major cause of morbidity. The incidence of empyema is about 3.3 per one lakh children[18].

Most children affected are below the age of 5years and males are more than females.(Freij BJ et. al. parapneumonic effusions and empyema in hospitalized children, a retrospective review)[19]

The cases are more common during the hot and humid conditions.

Pleural space contains 0.3ml/kg of body water of pleural fluid. It circulates continuously[20]. Infection of this fluid causes empyema.

There are three phases,

i) Exudative phase (Acute Phase)

It is characterized by collection of serous fluid in the pleural cavity. It is mostly neutrophil. It is sterile

ii) Fibrinopurulent phase

It is characterized by thickening of the fluid. There is accumulation of fibrin. The formation of the fibrin membrane leads to loculation within the pleural space.

iii) Organising phase

Inadequate or ineffective or delayed treatment leads to the third phase. It is characterized by resorption of fluid and

formation of the thick fibrous material which can entrap the lung.

The causes of empyema are

i) Pneumonia

ii) Bronchiectasis

iii) Ruptured lung abscess

iv) Trauma

v) Ruptured liver abscess

vi) Malignancies

vii) Spread from contiguous structures

Isolation of bacteria from pleural fluid varies from 8-76% . Baranwal et al. study showed 48% culture positivity[23]. Dass et al. study showed 32% positivity[24]. Bacterial isolation from pleural fluid varies from 8-76% (Powell et.al & Alkriinawi et. al)[21,22] . This wide variation is due to differences in sampling methods and also because of prior use of antibiotics.

The organism causing empyema include Streptococcus pneumoniae, Staphylococcus aureus, Haemophilus influenzae,

Pseudomonas aeruginosa, Anaerobes, Mycoplasma pneumoniae and fungi.

Currently studies from India reflect Staphylococcus aureus being most common, especially during hot and humid season where staphylococcal infection of skin are common (Baranwal et.al)[23].

During the pre antibiotic era Streptococcus pneumoniae was common followed by Streptococcus pyogenes and staphylococcus aureus. Use of Pencillin and sulphonamides reduced their incidence to a great extent. Now because of Penicillinase resistant strains, Streptococcus pneumoniae has increased once again. Staphylococcal skin infections are more common during hot and humid seasons. So Staphyloccal empyema is more common during these seasons.

Children are febrile, lethargic. History of difficulty in breathing , chest pain, abdominal pain may be present. Child feels comfortable on lying on the affected side. On examination children have tachypnoea, increased work of breathing and respiratory distress. Children appear toxic. There is dullness on percussion and diminished air entry on the affected side. In very sick cases there is cyanosis due to ventilation perfusion mismatch.

Diagnosis of empyema is based on good history, clinical findings and investigation. Chest X ray and Ultrasound help in diagnosis.

Blood culture is recommended. Though positivity is low it helps to choose antibiotics and also to identify the prevalent strains.

Pleural fluid analysis yield varies from 32-82% (Mishra et.al, Ghosh et. al study)[25,26]. Management includes initial stabilization and continuing care .

Initial stabilization.:-

It includes oxygen therapy, intravenous fluids, Antibiotics.

Staphylococcus aureus sensitive to Cloxacillin and Methicillin. Several studies have shown that streptococcus pneumoniae and staphylococcus aureus are most common organisms, So it is better to start with antibiotics that cover both the organisms.

Continuing care:-

Intercostal water seal drainage

Intrapleural fibrinolytics

Video assisted thorocospic surgery.

Empyema is a common problem in pediatrics. Most common organism are Streptococcus pneumoniae and Staphylococcal aureus[24]. Blood Culture and sensitivity and pleural fluid analysis has to be done before start of antibiotics.

It is important to suspect empyema in pneumonia not responding to treatment.

Staphylococcal aureus & Streptococcus pneumonia are common organisms.

Broad spectrum intravenous antibiotics and Intercostal Water Seal Drainage are the first line therapy.

Fibrinolytics and VATS have a definite role in early course.

Acute Central Nervous System Infections :-

Meningitis is the inflammation of the leptomeninges.

Acute meningeal inflammation secondary to bacterial infection is pyogenic / bacterial meningitis.

Bacterial meningitis is one of the serious infections. It is associated with acute complications and long term morbidity.

Bacterial meningitis affects all age groups. But it is more common during infancy. The organism causing meningitis vary with age and immune status in clinical staging.

Organisms causing meningitis[27]

Age	**Organism**
0-4weeks	Escherichia coli, Group B streptococcus, Listeria monocytogenes, Streptococcus pneumoniae
1-3months	Haemophilus influenzae type b, Streptococcus pneumoniae , Neisseria meningitidis, Escherichia coli, Group B Streptococcus, Listeria monocytogenes
3 months-18 years	Haemophilus influenzae type b, Neisseria meningitidis, Streptococcus pneumoniae,
Head trauma, neurosurgery,	Staphylococcus aureus
Ventriculoperitoneal shunt	Staphylococcus aureus, Staphylococcus epidermidis
CSF leak, cochlear implant	Streptococcus pneumoniae
Immunosuppressed patients	Pseudomonas aeruginosa, Proteus, Citrobacter, Escherichia coli

Routes of spread of infection

i) Blood spread

ii) Nasopharynx

iii) Direct spread (skull fracture, meningocele, encephalocele, and congenital defects in the skull.

iv) Spread from near by sites eg. middle ear infections, sinusitis[28]

v) Infected CSF shunts

The pathogens tide over the host's defence mechanisms and enter into the blood stream. The pathogens can easily proliferate in the CSF because the host defence mechanisms are poor. The bacterial components trigger an inflammatory cascade in the host. The cytokines promote the migration of neutrophils into the CSF[29]. The inflammation produced leads to abnormal cerebral blood flow and increased vascular permeability which in turn cause neurotoxicity.

Beyond neonatal period the causative organisms are streptococcus pneumoniae, Neisseria meningitidis. Incidence of Haemophilus influenzae has come down with immunization.

Other organisms include staphylococcus aureus, Pseudomonas aeuroginosa, coagulase negative staphylococci, Salmonella species, anaerobes, Listeria monocytogenes.

Bacterial meningitis presents as

1. Insidious form (most common) :
2. Rapid form
3. Fulminant course

In infants the symptoms of meningitis include fever, lethargy, irritability, poor feeding, vomiting , diarrhea, seizures or bulging fontanelles. In older children the clinical features are fever, headache, nausea, vomiting, confusion, lethargy or irritability. In older children the classical triad of meningitis is fever, headache and nuchal rigidity. The signs of meningitis include nuchal rigidity, kernig sign, Brudzinski sign. But these signs are reduced in young infants and immunocompromised patients.

The diagnosis is by complete blood count, electrolyte and blood sugar, blood culture and CSF analysis. The blood sample should be collected before starting the antimicrobial treatment. The yield of blood culture is 80-90% in bacterial meningitis[30]. The cerebrospinal fluid

analysis shows low sugar and high protein. CSF analysis helps to differentiate between various etiologic organisms causing meningitis. The diagnosis is confirmed by Gram stain, or positive CSF culture , PCR, Rapid Antigen Detection methods.

Bacterial meningitis scoring system

i) Positive CSF gram stain

ii) CSF protein >40mg/dl

iii) CSF Absolute Neutrophil count ≥1000cells/ml

iv) Peripheral Blood absolute Neutrophil count ≥10,000 cells/ml

v) History of seizures

Treatment includes supportive therapy and antimicrobial therapy.

Supportive therapy:-

1. Early recognition and prompt treatment of shock.

2. Intravenous maintenance fluids.

3. Maintaining electrolyte balance.

4. Treatment of acute symptoms like seizures.

5. Treatment of raised intracranial pressure.

6. Corticosteroids.

7. Early identification and treatment of complications.

Antimicrobial Therapy:-

Empirical antimicrobial agents[31]

Age	**Empirical antimicrobial therapy**
Neonate/Infant <3months	Cefotaxime plus Gentamicin(Ampicillin, if Group B Streptococcus is suspected)
>3months to 18 years	Cefotaxime or Ceftriaxone
Drug resistant Streptococcus pneumonia	Ceftriaxone plus Vancomycin or Rifampicin
Neurosurgery, CSF shunt, Head trauma	Ceftazidime plus Cloxacillin (or Vancomycin)

Antibiotics for Streptococcus pneumoniae, Beta lactam drugs such as Vancomycin is used.

For Streptococcus pneumoniae, Neisseria meningitidis and Haemophilus influenzae, Cefotaxime or Cetriaxone is used.

If Listeria monocytogenes is suspected then Ampicillin is to be added.

Pneumococcal meningitis can occur at all ages. It usually occurs following otitis media, sinusitis, pneumonia or head injury.

Staphylococcal meningitis follows otits media, mastoiditis, pneumonia, arthritis and septic lesions of scalp or skin.

Haemophilus influenza meningitis is common in between 3 and 12 months . Residual auditory deficits are common.

The duration of antimicrobial therapy in acute meningitis depends on the pathogen. For Haemophilus influenza and Neisseria meningitidis is seven days. The duration of treatment for Streptococcus pneumoniae is ten to fourteen days. For Group B streptococcus it is 14 to 21 days. The duration of treatment for Listeria monocytogenes is 21 days[32].

Immunisation against Haemophilus influenza has reduced the incidence of meningitis in children less than two years. The complication of meningitis includes shock, raised intracranial pressure, syndrome of inappropriate ADH secretion, hydrocephalus, hearing loss, learning disability and intellectual impairment and physical disability. The mortality of untreated bacterial meningitis is high. The poor prognostic

factors include young age, male gender, seizures , shock , impaired consciousness.

(El Barhri J Booy R, Diagnosis and treatment of bacterial meningitis, Arch Dis of Child 2003; 88;615-20)

Brain abscess

Focal infection of cerebrum or cerebellum.

Child may present with fever, altered sensorium, elevated intracranial pressure, headache and focal neurological deficit.

Causative organisms are streptococci, Staphylococcus aureus, Pneumococcus, Proteus and Haemphilus influenza[33].

Predisposing factors are otitis media, sinusitis, mastoidits, trauma, cyanotic heart disease, immunodeficiency.

Diagnosed by CT or MRI .

Treatment is based on probable pathogenesis and the organism[34].

Treatment is third generation cephalosporin and Vancomycin.

Meropenam for Gram negative bacilli and anaerobes. Ampicillin for Listeria monocytogenes.

Urinary Tract Infection.

It is a common bacterial infection in infants and children. It is identified by its symptoms or findings on urinalysis or both. The common causes of infection is by colonic bacteria about 75 to 90% of infections are caused by Escherichia coli followed by Klebsiella species and Proteus species. It is important because even a single episode of UTI can cause permanent renal parenchymal damage and renal scarring[35]. It may lead to hypertension and progressive renal damage. Urinary tract infection should be excluded in all children having fever without focus.

First few months , incidence is more in boys than girls. By the end of first year and thereafter it is more common in girls[36].

Under five children are more prone to Urinary Tract Infection because of periurethral colonization by Escherichia coli, Enterococci and proteus species.

In a study by Elder J S et al., most common organisms in Urinary Tract Infection are Escherchia coli, Klebsiella and Proteus, others are Enterococcus, Pseudomonas aeruginosa, Adenovirus, Candida[37].

Most Urinary Tract Infections are ascending infections and some in from fecal flora.

Rarely infection occurs by hematogenous route.

Risk factors

- Female gender
- Uncircumcised male
- Toilet training
- Constipation

Children present with fever , lower abdominal pain, burning micturition, frequency and urgency of urination.

Complications of UTI are pyelonephritis , renal abscess, renal scarring. Long term complications are hypertension, impaired kidney function and end stage renal disease.

Diagnosis is based on symptoms or findings in urine analysis or both.

Urine culture is necessary for confirmation and appropriate antibiotic therapy. Urine culture is the gold standard for diagnosing Urinary Tract Infections[38]. The various collection methods are

i) Suprapubic aspiration – this is the ideal method of collection of urine

ii) Catheterisation – It is the commonly used collection technique in infants and young children.

iii) Midstream clean catch – It is ideal for older children.

Treatment includes trimethoprim-sulphamethoxazole for Escherichia coli. Nitrofurantoin is effective against Klebsiella and Enterobacter. Amoxycillin, now has high resistant rates. Third generation cephalosporins and Aminoglycosides are effective.

Overall prognosis is good. But delay in diagnosis and treatment will result in renal damage.

Diagnosis of UTI is important even a single episode of UTI can cause permanent renal parenchyma damage.

Goal of imaging in children is to identify the anatomic abnormalities.

Nephrotic syndrome with Spontaneous Bacterial Peritonitis;

Nephrotic syndrome is a rare disease (2–7 cases/year per 100,000 children aged less than 14 years), characterized by edema, massive proteinuria and hypoalbuminemia. Its rarity makes the management of the disease cumbersome, especially in non-specialized centers. Treatment

includes corticosteroids, which induce remission in 90–95 % of children. About 50 % of these frequently relapse and become steroid-dependent.

Symptomatic treatment is important. Several complications can occur (infections, thromboembolism, hypovolemia). It is because of the disease itself or due to steroid therapy. In a retrospective study of 214 children with nephrotic syndrome conducted at Children's Medical Center and Parkland Memorial Hospital , Incidence of primary peritonitis was 17.3% . Streptococcus pneumoniae was the major causative organism which attributed to 38% . Gram-negative organisms were isolated from 3% of patients. The incidence and bacteriology of peritonitis has not changed during the 20-year period. Peritonitis is characterized by abdominal pain (98%), fever (95%), rebound tenderness (85%), and nausea and vomiting (71%).

Major infections in Nephrotic Syndrome is as follows:

(1) Peritonitis[39]: Abdominal pain, tenderness, distension, diarrhea, or vomiting, with ascitic fluid >100 leukocytes/mm3 and minimum 50% neutrophils and/ or positive culture .

(2) Pneumonia: fast breathing and chest indrawing with chest X-ray confirmation

(3) Urinary tract infection (UTI): Bacterial colony count of $>10^5$ organisms/mL in a clean-catch midstream urine sample with fever (>38.5ºC), dysuria or increased urination frequency.

(4) Cellulitis: Erythema, warmth, swelling, fever and local tenderness in any body part.

(5) Meningitis: Fever and one of the following: neck rigidity, altered sensorium, seizures, with confirmation by cerebrospinal fluid cytology, biochemistry and culture.

Peritonitis is inflammation of peritoneum. It may be primary or secondary. Child with Nephrotic syndrome is prone for Spontaneous Bacterial Peritonitis[40,41]. Pneumococci, Group A streptococci, Enterococci , Staphylococci, Escherichia coli and Klebsiella.

Clinical features are fever and abdominal pain. Vomiting and diarrhea can also occur. Hypotension and tachycardia are common.

Diagnosis is by complete blood count, Ascitic fluid analysis, Ultrasound.

Peritonitis in Nephrotic syndrome is monomicrobial.

Antibiotic of choice is third generation cephalosporin like cefotaxime.

Based on sensitivity Vancomycin may be added. Therapy is continued for fourteen days.

Acute Gastroenteritis with Septic Shock

In children Acute Gastroenteritis is one of the commonest causes for septic shock. This is more in developing countries than the developed countries. It accounts for 19% of the pediatric death.

Causative organisms are Shigella, Escherichia coli, Giardia, Entamoeba, Campylobacter jejuni, Staphylococcus aureus, Salmonella, Vibrio cholera, Clostridium difficile, Vibrio parahemolyticus.

Clinical features include fever, nausea, vomiting , loose stools and abdominal pain. Children may present with tachycardia and hypotension.

Diagnosis is by complete blood count, blood culture and stool culture.

Antibiotics of choice for Shigella is Ceftriaxone and Ciprofloxacin[42]. For Escherichia coli choice of antibiotic is Ciprofloxacin and trimethoprim-sulphamethoxazole. For Campylobacter jejuni

antibiotic preferred is Erythromycin/ Azithromycin. For Clostridium difficile treatment of choice is metronidazole.

Skin and Soft tissue infections:-

Skin and Soft tissue infections are common problems both in outpatient and inpatient groups. Infection may vary from simple to severe requiring intensive care. Infections of Skin and Soft tissue can result in significant morbidity including arthritis, carditis, nephritis and septicemia.

It is essential to quickly identify the organisms, assess , evaluate and begin appropriate antibiotics. Infection occurs when there is breakdown of the skin allowing bacteria that are normal colonizing flora to invade the subcutaneous tissue[43]. After bacteria enter the skin they cause serious infections.

Common organisms are staphylococcus aureus and streptococci.In a study by Bernad P et al., Staphylococcus aureus infection of the skin is common[43]. Nowadays methicillin resistant staphylococcus are increasing. Management includes

1) Resuscitation of patients
2) Drainage of purulent material / obtaining specimen for culture.

3) Appropriate Antimicrobial coverage.

Cellulitis is infection of connective tissue. Predisposing factors are trauma and immunosuppresion.

In a study by Hedrick J et al., causative organisms are Streptococcus pyogenes and Staphlococcus aureus[44]. Others are pseudomonas aeruginosa, Aeromonas hydrophile, Legionella, Escherichia coli. etc

It is characterized by edema, warmth, erythema and tenderness. Complications include abscess, osteomyelitis, septic arthritis etc.

Diagnosis is by Blood culture and aspirates.

Treatment is Antistaphylococcal antibiotics such as Methicillin , Vancomycin and aminoglycoside like gentamycin or cephalosporin like cefotaxime.

Organisms:-

Staphylococcus

Gram positive cocci. They occur in grape like clusters. It was first identified by Von Recklinghausen. Staphylococcus means a bunch of grapes. They grow in temperature range of 10-42 degree celcius and pH 7.4 to 7.6. They are aerobes and facultative anaerobes. On nutrient agar,

they have a characteristic “Oil paint appearance”. Virulence factors include structural components, toxins and enzymes. The structural components are capsule, slime layer, teichoic acid, Protein A and Peptidoglycan. The toxins are cytotoxin and exfoliative toxins, Enterotoxin , Toxic shock syndrome toxin. The enzymes are coagulase, hyaluronidase, fibrinolysin, lipases and nucleases. The diseases caused by Staphylococcus aureus include toxin mediated disease (food poisoning, TSS, SSS) , pyogenic diseases and other systemic diseases. Hospital and community acquired infection with MRSA are two world wide problem. They are present as normal flora on human skin and mucosal surfaces. They survive in dry surfaces for long periods. Those at risk include infants, children with poor personal hygiene, those with intra vascular catheter or shunts.

The diagnosis is by microscopy culture. They grow rapidly when cultured on non selective media.

The antibiotic of choice is penicillin. In penicillinase producing strain Methicillin and Cloxacillin are effective. For Methicillin resistant Staphylococcus aureus Vancomycin is effective.

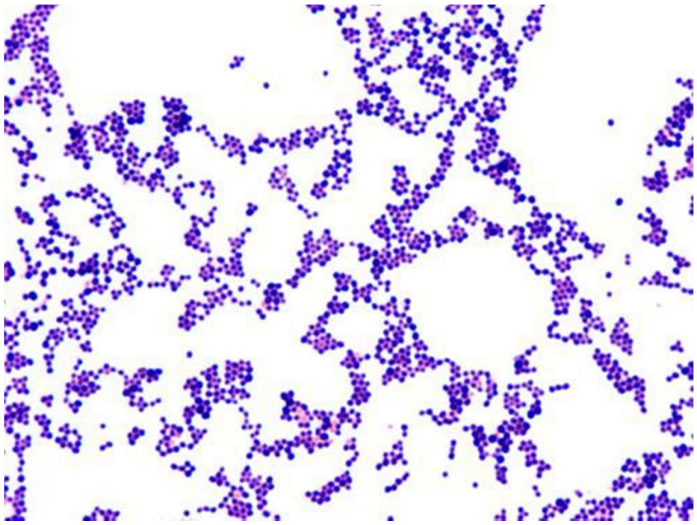


Figure .1 ; Staphylococcus aureus

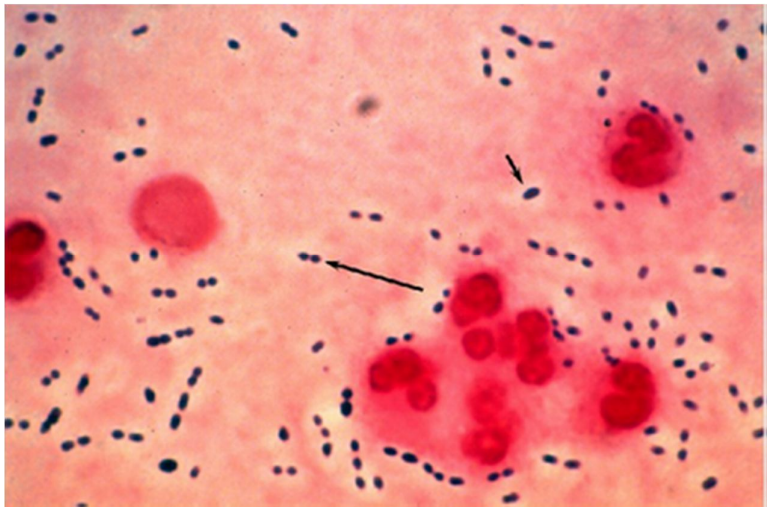


Figure . 2 ; Streptococcus pneumoniae

Streptococcus pneumoniae

Streptococcus pneumoniae is a gram-positive coccus. It is nonmotile , non-spore forming, catalase negative, oxidase negative, facultatively anaerobic. They are found in pairs of cocci, or diplococci, short chains or singly. They show alpha hemolysis on blood agar.

Identification of Streptococcus pneumoniae

- The optochin test (sensitive to optochin)
- The bile solubility test (positive)
- Capsular swelling reaction

The capsule is responsible for virulence . There are over 90 serotypes of S. pneumoniae . The capsule interferes with phagocytosis by preventing opsonization of the bacterial cells. S. pneumoniae is the leading cause of pneumonia in all ages. S. pneumonia also causes sinusitis, otitis media. peritonitis, arthritis and meningitis.

If penicillin susceptible treat with penicillin, ampicillin. If penicillin resistant: cephalosporins III (e.g., cefotaxime, ceftriaxone). Alternatives: vancomycin,chloramphenicol.

Pseudomonas aeruginosa

Pseudomonas aeruginosa is a Gram-negative, rod-shaped, motile organism (polar flagella). It produces pigments like pyocyanin (blue-green), pyoverdin (yellow-green, fluorescent), and pyorubin (red-brown, produced by a small proportion of strains).

Pseudomonas aeruginosa is often preliminarily identified by its typical odor in vitro. The oxidase and catalase test for P. aeruginosa are positive.

Pseudomonas aeruginosa infects burns, wounds, surgical incisions and sites of catheterization. It is the most common cause of infections of burn injuries and of the outer ear (otitis externa). It can cause community-acquired pneumonias and ventilator-associated pneumonias. P. aeruginosa has potential to develop resistance against antibiotic It is sensitive to Piperacillin, Ticarcillin, Ceftazidime and cefaperazone.

Klebsiella

Klebsiella pneumoniae is urease positive , metabolise glucose with production of gas and is lactose positive. Klebsiella pneumoniae is a Gram-negative, non-motile, encapsulated, lactose fermenting, facultative anaerobic, rod shaped bacterium found in the normal flora of the intestines. It is clinically the most important member of

the Klebsiella genus of Enterobacteriaceae. It naturally occurs in the soil and about 30% of strains can fix nitrogen in anaerobic condition.

As a general rule, Klebsiella infections tend to occur in people with a weakened immune system. Many of these infections are obtained when a person is in the hospital for some other reason (a nosocomial infection).

The most common infection caused by Klebsiella bacteria outside the hospital is pneumonia.

New antibiotic resistant strains of K. pneumoniae are appearing, and it is increasingly found as a nosocomial infection. Klebsiella ranks second to E. coli for urinary tract infections

Escherichia coli

Escherichia coli is a Gram-negative, rod-shaped bacterium that is commonly found in the lower intestine of humans. Most E. coli strains are harmless, but some serotypes can cause serious food poisoning in humans. The harmless strains are part of the normal flora of the gut, and can benefit their hosts by producing vitamin K2, and by preventing the establishment of pathogenic bacteria within the intestine. E. coli and related bacteria constitute about 0.1% of gut flora, and fecal-oral transmission is the major route through which pathogenic strains of the bacterium cause disease.

Figure. 3. Pseudomonas aeruginosa

Figure. 4. Klebsiella Pneumoniae

Antibiotic treatment of Escherichia coli infections if susceptible are Cephalosporins I, II, III (e.g., ceftriaxone), Ampicillin, Aminoglycosides, Trimethoprim-sulfamethoxazole, Doxycycline and Nitrofurantoin. Alternatives: Quinolones (e.g., norfloxacin, ofloxacin, ciprofloxacin), Imipenem , Meropenem.

Proteus

Proteus mirabilis is part of the normal flora of the human gastrointestinal tract. It can also be found free living in water and soil. When this organism, however, enters the urinary tract, wounds, or the lungs it can become pathogenic. Proteus mirabilis commonly causes urinary tract infections and the formation of stones.

Proteus mirabilis is part of the Enterobacteriaceae family. It is a small gram-negative bacillus and a facultative anaerobe. Proteus mirabilis is characterized by its swarming motility, its ability to ferment maltose, and its inability to ferment lactose. P. mirabilis has the ability to elongate itself and secrete a polysaccharide when in contact with solid surfaces, making it extremely motile on items such as medical equipment.

Figure. 5 : Proteus

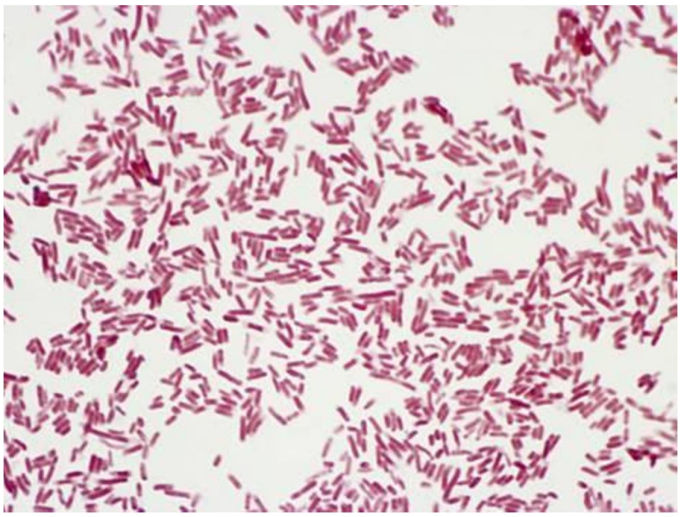


Figure.6 : Escherichia coli

The most common infection involving Proteus mirabilis occurs when the bacteria moves to the urethra and urinary bladder. Although Proteus mirabilis mostly known to cause urinary tract infections, the majority of urinary tract infections are due to E. coli.

Coagulase negative staphylococcus

The standard approach for detection and identification includes culturing on a nonselective blood agar plate as well as in enrichment broth, followed by biochemical and other related procedures, including the use of commercial systems for identification purposes. The more benign coagulase-negative staphylococci have surfaced more recently as a cause of human infections . Host factors that predispose to coagulase-negative staphylococci infections include immunosuppression and the presence of a medical device. Under any of these circumstances there appears to be no one species that predisposes to such infections , however, there are some species of coagulase-negative staphylococci that have been associated with particular infections other than immunosuppression or a medical device

METHODOLOGY

PLACE

Pediatric Intensive Care Unit at Coimbatore Medical College Hospital.

STUDY POPULATION

Children between one month to 12 yrs of age admitted in Pediatric Intensive Care Unit of Coimbatore Medical College Hospital.

Method of collection of Data

The data was collected

i) By interviewing parents

ii) From hospital records

iii) By examination of patients

Study Design

Prospective study / Descriptive study

Study Period

One year - July 2016 to June 2017

Selection Criteria:-

Inclusion Criteria:-

1. Children admitted in PICU for infectious disease like empyema, sepsis, meningitis, abscess etc., from where body fluids can be collected for analysis.

2. Children between one month and twelve years of age.

Exclusion Criteria:-

1. Children with underlying chronic condition like HIV
2. Children hospitalized for > 48 hrs in the last two weeks.
3. Children with antibiotic therapy for > 48 hrs prior to admission .

Consent & Ethical Clearance (Refer Annexure- I)

Informed/Written consent was obtained from the parents after explaining in detail about the method of study and the procedures involved. Ethical committee clearance was also obtained.

Sample collection

Blood

Blood collection is the most important procedure in the microbiology laboratory. Its success depends on method of collection of

sample. Volume of blood is an important factor determining the result. In Children about 5-10ml per culture is needed. Careful disinfection of the skin is important. Skin should be disinfected with 70% alcohol. It is followed by disinfection with 2% iodine. Ideally sample should be collected before antibiotics are started. Ideally two to three blood samples may be obtained during a 24 hour period. Blood samples are inoculated directly into the bottles which are filled with nutrient broths. These broths are incubated at 37% and microbial growth observed. When growth is detected, subcultures are done to isolate the organism. The organism is identified and antimicrobial susceptibility is tested. The timing for blood collection is not important in cases of continuous septicemia; but it is significant in those with intermittent septicemia.

Cerebrospinal fluid

Bacterial meningitis is a more serious problem. It has high morbidity and mortality. Hence the diagnosis should not be delayed. Under strict aseptic precautions (cleaning the area with 70% alcohol ; 2% povidone and again alcohol) , lumbar puncture is done. The collected sample should be processed immediately. It should not be refrigerated or incubated. The CSF fluid is collected into sterile screw capped tubes. Once the sample is received in the laboratory, it should be concentrated

by centrifugation. The sediment is used to inoculate bacteriologic media. For bacterial culture 1-5 ml of fluid is necessary. For mycobacterial culture large volume is needed.

Body fluids

Fluids collected for culture include peritoneal, pleural, synovial and pericardial fluids. If large volumes of fluids could be obtained, it should be inoculated into blood culture bottles containing nutrient media. A small quantity is sent to the laboratory in a sterile tube so that appropriate stains can be prepared. There may be few organisms in the sample. It is because of the dilution of organism or their elimination by host immune response. But if only small volume is collected it is inoculated directly on to agar media and enriched broth media. The specimen should not be exposed to oxygen.

Urine

One of the most commonly done test is urine culture. The first portion of urine collected should be discarded as it contains potentially pathogenic bacteria that colonise the urethra. There should not be any delay in transport of specimen. If it is not possible the specimen should be refrigerated. Contamination of specimen should be avoided. About 1ml is needed. In case of Mycobacterium 10ml is needed.

Fecal specimen

Gastrointestinal infection are caused by a number of bacteria. An adequate good sample must be collected. It must be transferred in appropriate manner and inoculated onto the selective media. The specimen is collected in a tightly sealed water proof container. It should be transported soon to prevent acidic changes in the stool. If it is not possible to send it soon, the faeces should be mixed with a preservative such as Cary Blair medium or mixed with glycerol. It is necessary to inform the lab which organism is suspected because this will help them to select appropriate specialized culture media.

Skin and soft tissue

Wounds can be contaminated with organism unrelated to specific infectious process. Hence sample collection technique is important. Clear the surface and collect the samples from deep in the wound. Aspirates from an abscess should be collected from the central portion and also the wall of the abscess. It is because organism replicate at the base of the abscess. Aspirate of the abscesses can be sent for culture. When the aspirate is small in quantity, saline infusion is given and material is obtained. The specimen should be transported in a sterile screw-capped

container. If the sample is small, sterile saline may be added. To prevent contamination , efforts should be made to send an appropriate specimen.

The samples obtained by above methods were sent to the microbiology department. There the organisms were identified initially and their sensitivity pattern was determined.

TABLES AND CHARTS

Table. 1. Age Distribution

Age	Male	Female	Total	(%)
1-3months	11	21	32	8%
4months - 1yr	46	32	78	18%
1yr - 5 yrs	85	64	149	35%
6 -12 yrs	92	73	165	39%
TOTAL	234	190	424	100%

Figure. .7. Age & Gender Distribution

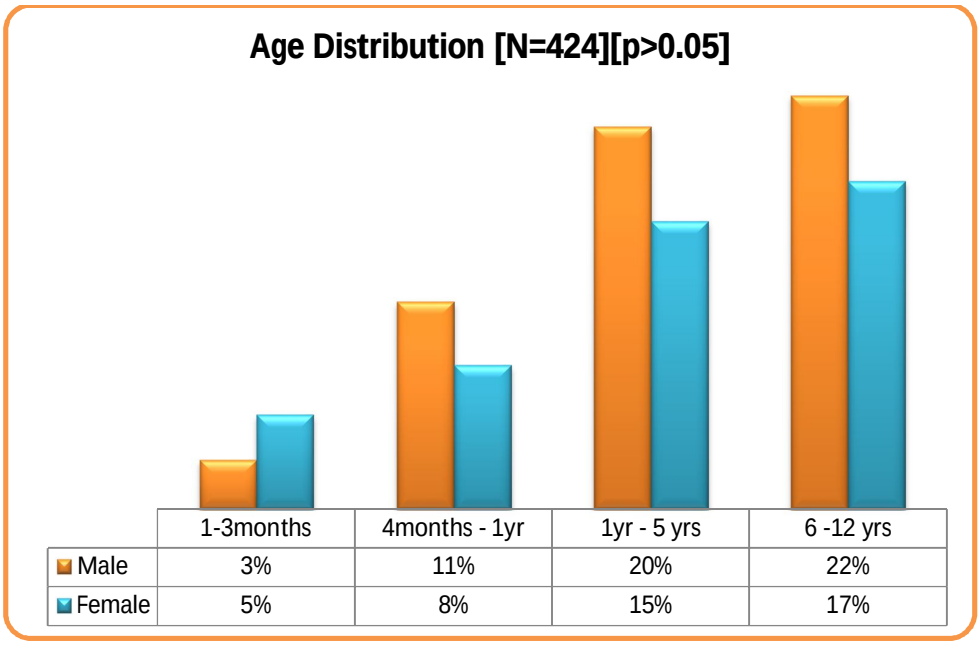


Table. 2. Gender Distribution of positive cases

	Male	Female	Total
1-3months	2	2	4
4months - 1yr	4	4	8
1yr - 5 yrs	17	18	35
6 -12 yrs	20	17	37

Figure.8. Gender Distribution

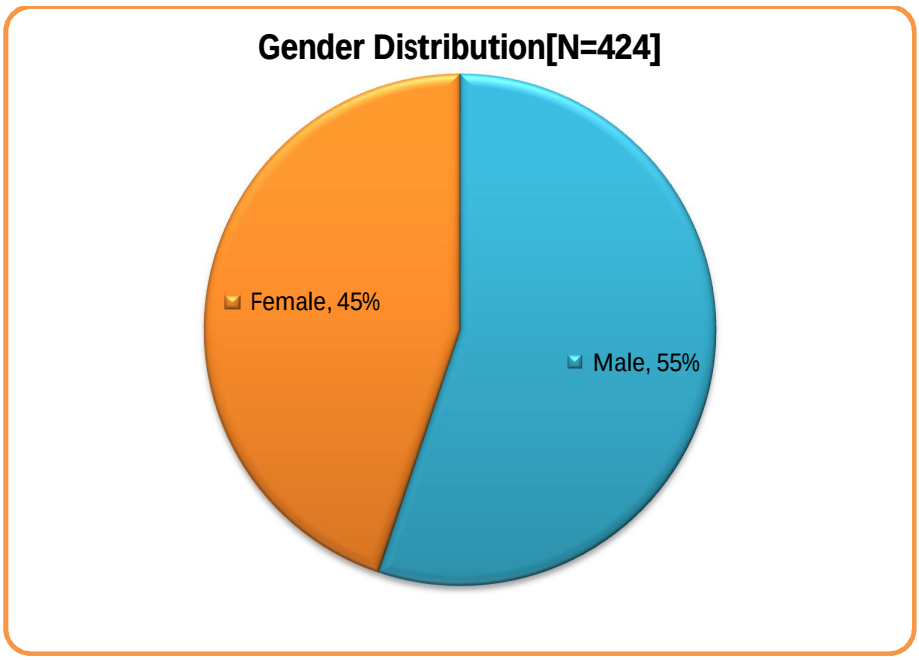
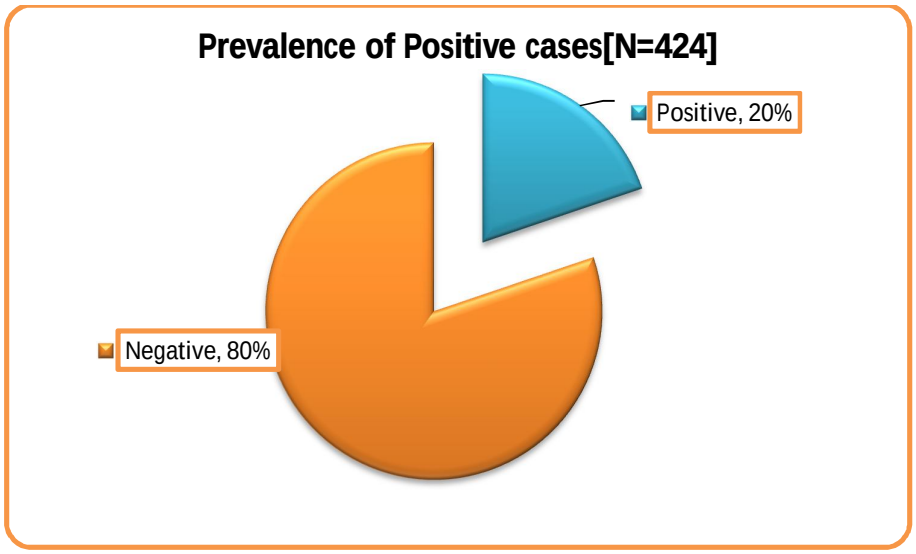


Table.3. Prevalence of positive cases

Age	Positive	Negative	Total	(%)
1-3months	4	28	32	8%
4months - 1yr	8	70	78	18%
1yr - 5 yrs	35	114	149	35%
6 -12 yrs	37	128	165	39%
TOTAL	84	340	424	100%

Figure.9. Prevalence of positive cases



PNEUMONIA

Figure. 10.Prevalence of Positive cases of Pneumonia

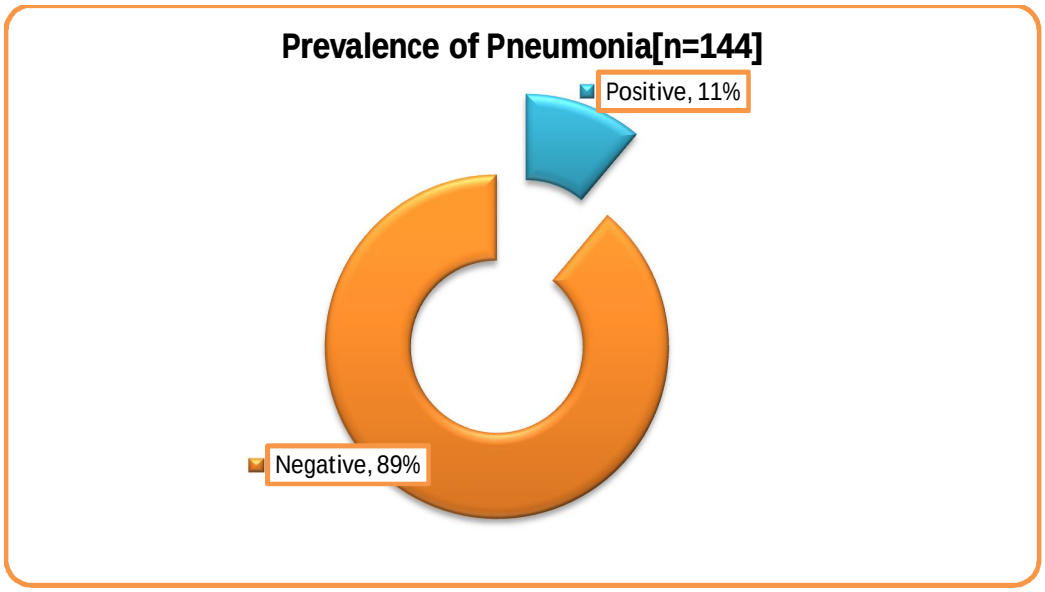


Table.4. Prevalence of Pneumonia with Age Distribution

Age	Positive	Negative	Total	(%)
1-3months	2	15	17	12%
4months - 1yr	3	48	51	35%
1yr - 5 yrs	6	42	48	33%
6 -12 yrs	5	23	28	19%
TOTAL	16	128	144	34%

Figure.11. Prevalence of Pneumonia with Age Distribution

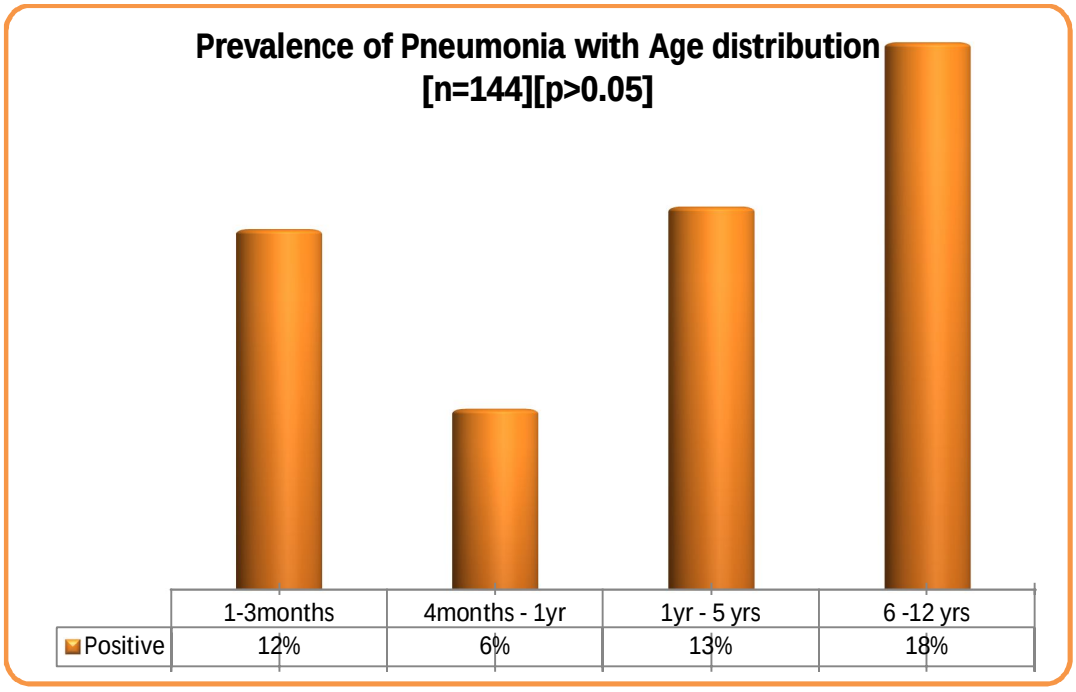


Table.5. Age and Gender distribution of Pneumonia

AGE	MALE [n=82]				FEMALE[n=62]				TOTAL
	1-3months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	1-3 mon	4mon - 1yr	1-5 yrs	6-12 yrs	
TOTAL	6	32	28	16	11	19	20	12	144
Positive	1	1	4	4	1	2	2	1	16
(%)	1%	1%	5%	5%	2%	3%	3%	2%	11%
Sig	p>0.05				p>0.05				

Figure.12.Age and Gender Distribution with Pneumonia

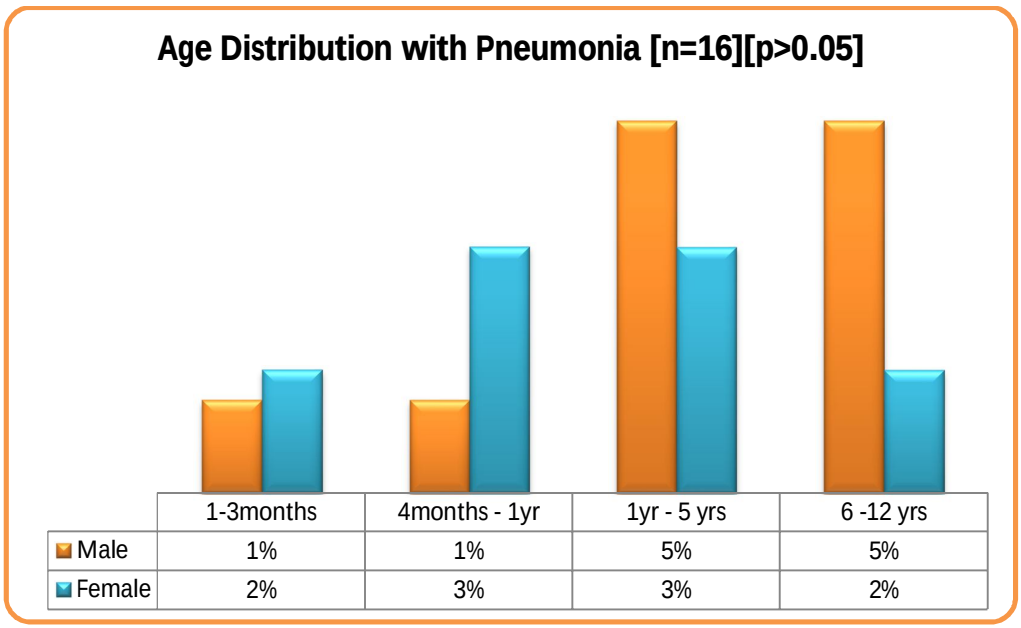


Table.6. Age Distribution with Organisms

Organism	1- 3 months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	TOTAL	(%)
Klebsiella		2	2	2	6	38%
Proteus			1		1	6%
Coag-ve staph	1	1	2	2	6	38%
Staph aureus	1		1	1	3	19%
Total	2	3	6	5	16	
(%)	13%	19%	38%	31%	100%	

Figure.13.Age Distribution with Organisms

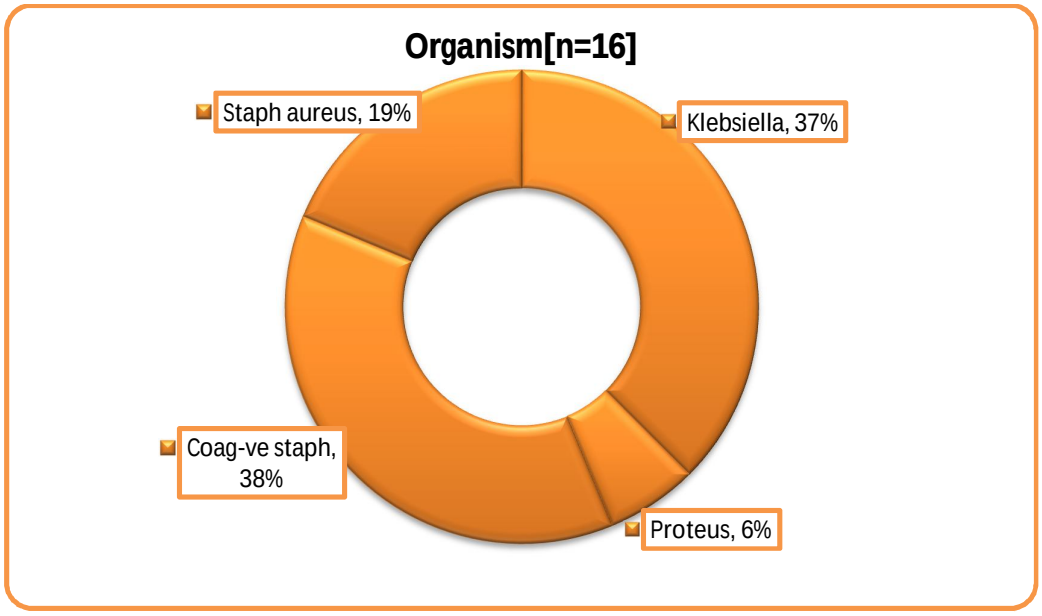
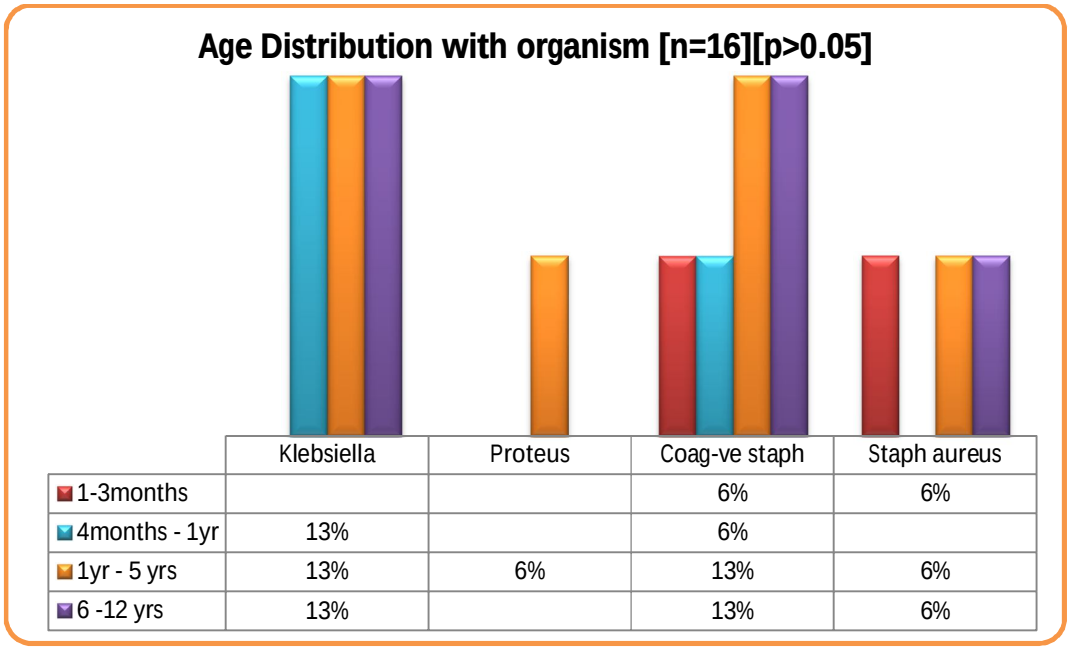


Figure.14.Age Distribution with Organisms



	Klebsiella	Proteus	Coag-ve staph	Staph aureus
1-3months			6%	6%
4months - 1yr	13%		6%	
1yr - 5 yrs	13%	6%	13%	6%
6 -12 yrs	13%		13%	6%

Table.7.Antibiotic Sensitivity Pattern of Organisms in Pneumonia

Drugs	Klebsiella	Proteus	Coag-ve staph	Staph aureus
Cfs	3	1	3	1
Cip	1	0	1	2
Oflox	1	1	1	0
Genta	5	0	3	3
Ak	5	1	6	2
Ctx	5	1	6	3
Amx	1	0	0	2
CN	3	0	4	3
Ctz	0	0	1	2
E	0	0	2	2
Cot	0	0	3	0
Nit	0	0	1	0

Table.8.Antibiotic Sensitivity Pattern of Organisms in Pneumonia

Drugs	Klebsiella [n=6]	(%)	Proteus [n=1]	(%)	Coag-ve staph[n=6]	(%)	Staph aureus[n=3]	(%)
Cfs	3	50%	1	100%	3	50%	1	33%
Cip	1	17%	0	0%	1	17%	2	67%
Oflox	1	17%	1	100%	1	17%	0	0%
Genta	5	83%	0	0%	3	50%	3	100%
Ak	5	83%	1	100%	6	100%	2	67%
Ctx	5	83%	1	100%	6	100%	3	100%
Amx	1	17%	0	0%	0	0%	2	67%
CN	3	50%	0	0%	4	67%	3	100%
Ctz	0	0%	0	0%	1	17%	2	67%
E	0	0%	0	0%	2	33%	2	67%
Cot	0	0%	0	0%	3	50%	0	0%
Nit	0	0%	0	0%	1	17%	0	0%

Table.9.Antibiotic Resistance Pattern of Organisms in Pneumonia

Drugs	Klebsiella	Proteus	Coag-ve staph	Staph aureus
Cot	6	1	3	3
CN	3	0	3	0
G	1	1	0	0
AK	1	1	0	0
Nx	1	1	0	0
Cip	5	1	3	1
Nit	1	0	0	1
Amx	5	0	3	2
E	0	0	1	1
Doxy	0	0	0	1
Ctx	0	0	2	0
Cfs	3	0	1	0

Table.10. Antibiotic Resistance Pattern of Organisms in Pneumonia

Drugs	Klebsiella	(%)	Proteus	(%)	Coag-ve staph	(%)	Staph aureus	(%)
Cot	6	100%	1	100%	3	50%	3	100%
CN	3	50%	0	0%	3	50%	0	0%
G	1	17%	1	100%	0	0%	0	0%
AK	1	17%	1	100%	0	0%	0	0%
Nx	1	17%	1	100%	0	0%	0	0%
Cip	5	83%	1	100%	3	50%	1	33%
Nit	1	17%	0	0%	0	0%	1	33%
Amx	5	83%	0	0%	3	50%	2	67%
E	0	0%	0	0%	1	17%	1	33%
Doxy	0	0%	0	0%	0	0%	1	33%
Ctx	0	0%	0	0%	2	33%	0	0%
Cfs	3	50%	0	0%	1	17%	0	0%

EMPYEMA

Figure. 15. Prevalence of Empyema

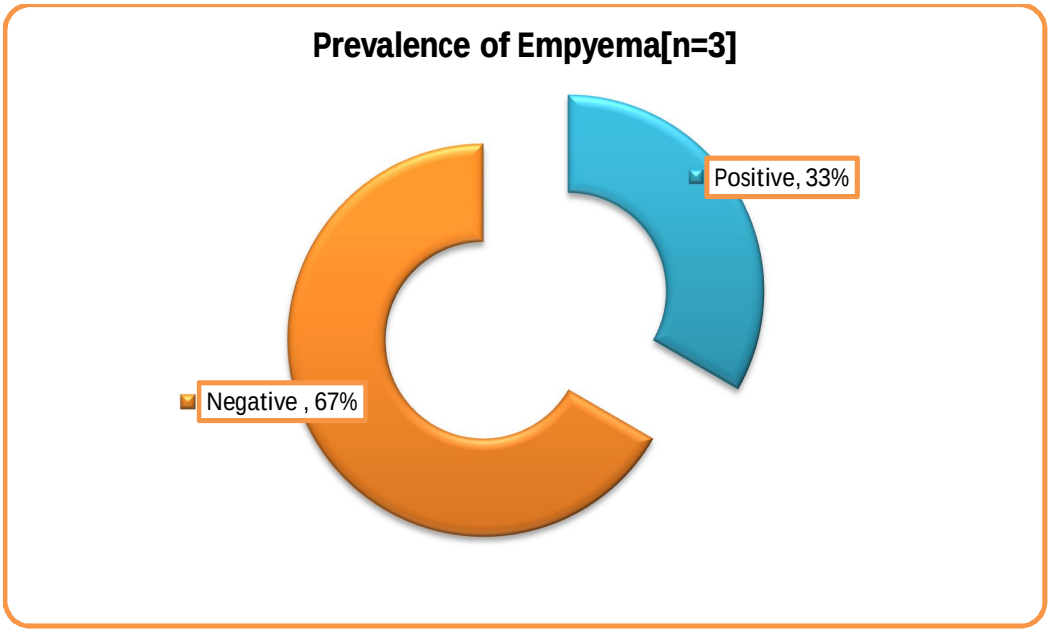


Table.11.Age Distribution of Empyema

Age	Positive	Negative	Total	(%)
1-3months	0	0	0	0%
4months - 1yr	0	0	0	0%
1yr - 5 yrs	1	2	3	100%
6 -12 yrs	0	0	0	0%
TOTAL	1	2	3	

Table.12.Age and Gender Distribution of Empyema

AGE	MALE [n=1]				FEMALE [n=2]				TOTAL
	1-3months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	1-3 mon	4mon - 1yr	1-5 yrs	6-12yrs	
TOTAL			1				2		3
Positive			0				1		1
(%)	0%	0%	0%	0%	0%	0%	33%	0%	33%

Table.13. Antibiotic Sensitivity Pattern of Organisms

Drugs	Staph aureus	(%)
Ak	1	100%
Cfs	1	100%
Doxy	0	0%
Ctx	1	100%
Ctz	0	0%
E	0	0%
G	1	100%

Figure.16. Antibiotic Sensitivity Pattern of Organisms

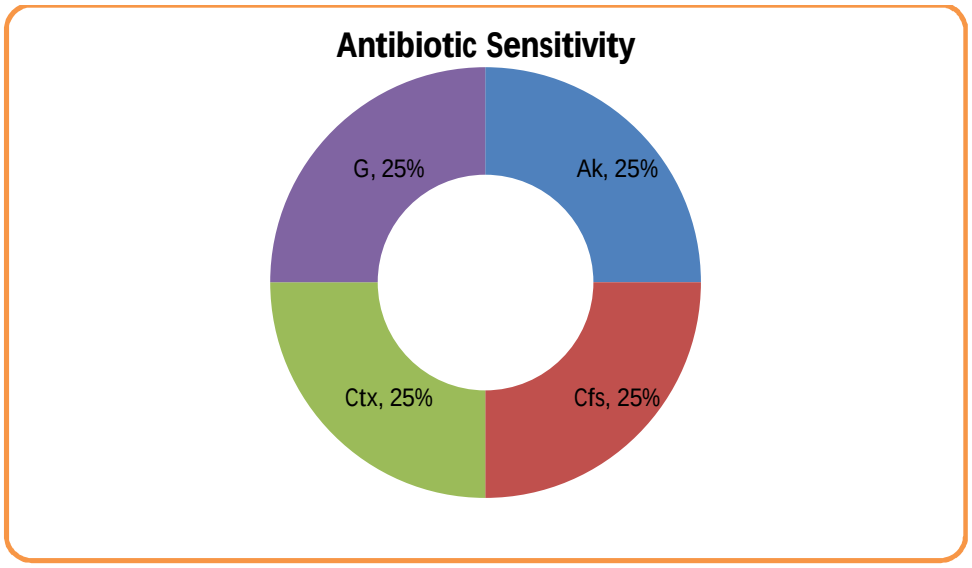


Table.14. Antibiotic Resistance Pattern of Organisms

Drugs	Staph aureus	(%)
Cip	1	100%
CN	1	100%
Cot	1	100%
Amx	1	100%

Figure.17. Antibiotic Resistance Pattern of Organisms

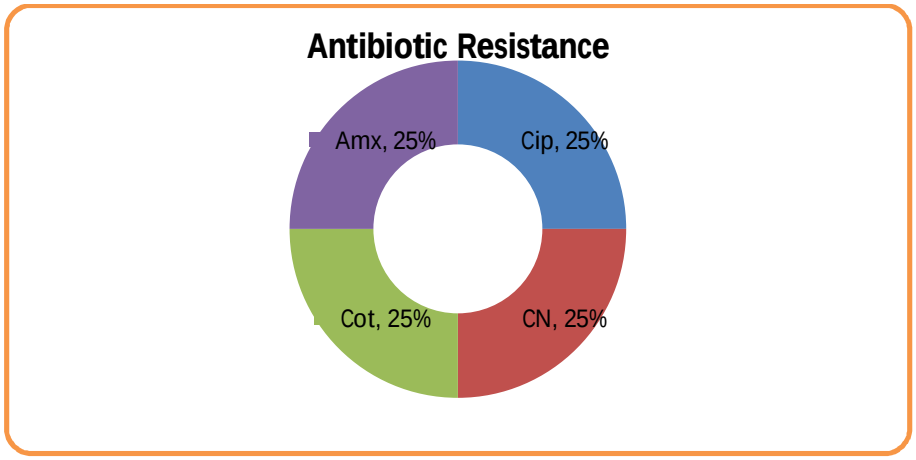
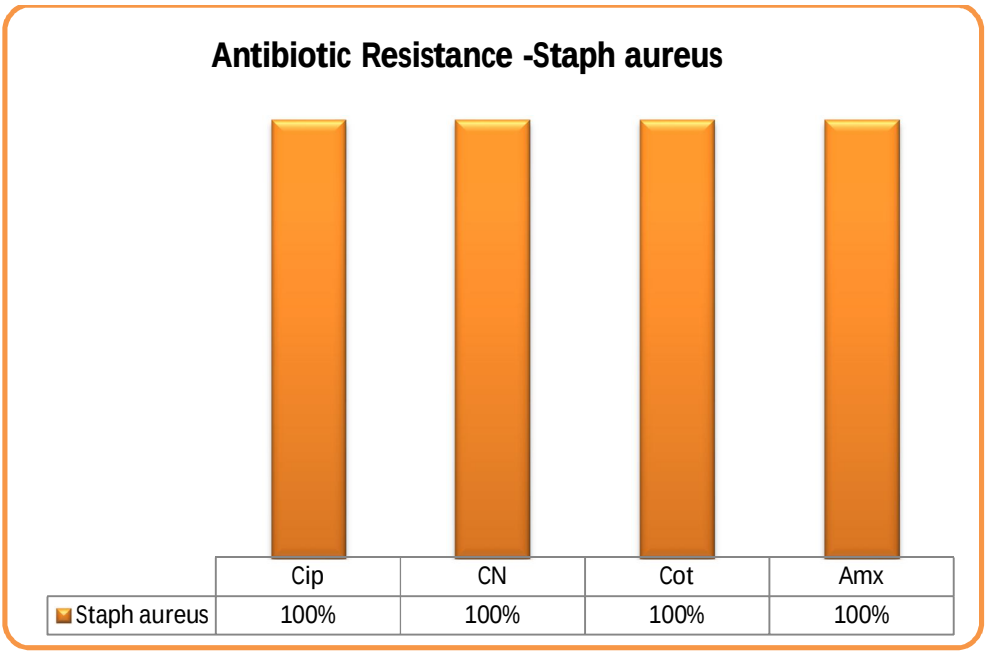


Figure.18. Antibiotic Resistance Pattern of Organisms



URINARY TRACT INFECTION

Figure.19. Prevalence of Urinary Tract Infection

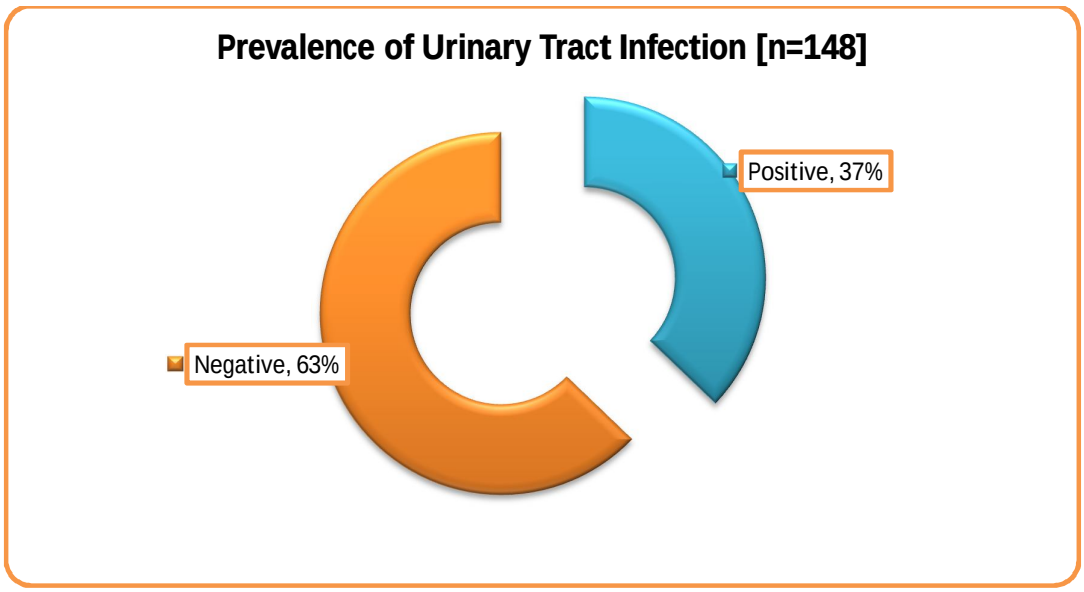


Table.15.Prevalence of UTI with Age Distribution

Age	Positive	Negative	Total	(%)
1-3months	2	1	3	2%
4months - 1yr	4	5	9	6%
1yr - 5 yrs	22	30	52	35%
6 -12 yrs	27	57	84	57%
TOTAL	55	93	148	100%

Figure.20.Prevalence of UTI with Age Distribution

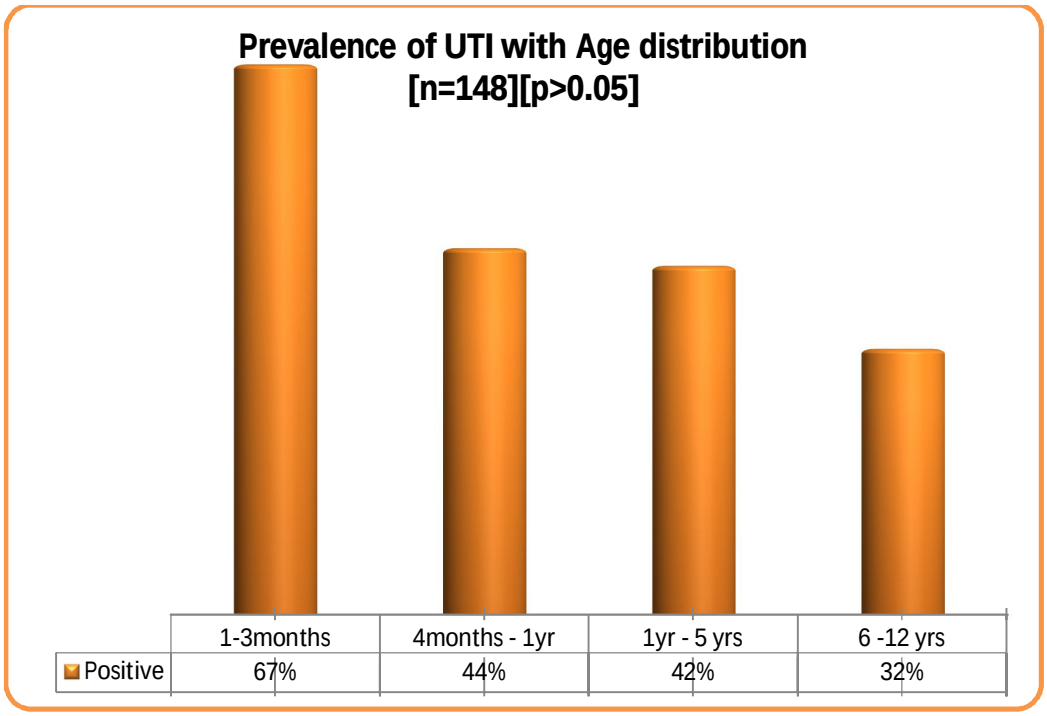


Table.16.Age and Gender Distribution of UTI

AGE	MALE [n=80]				FEMALE[n=68]				TOTAL
	1-3 months	**4months - 1yr**	**1yr - 5 yrs**	**6 -12 yrs**	**1-3mon**	**4mon - 1yr**	**1-5 yrs**	**6-12 yrs**	
TOTAL	1	4	29	46	2	5	23	38	148
Positive	1	2	10	14	1	2	12	13	55
(%)	1%	3%	13%	18%	2%	4%	22%	24%	37%
sig	p>0.05				p>0.05				

Figure.21.Age and Gender Distribution of UTI

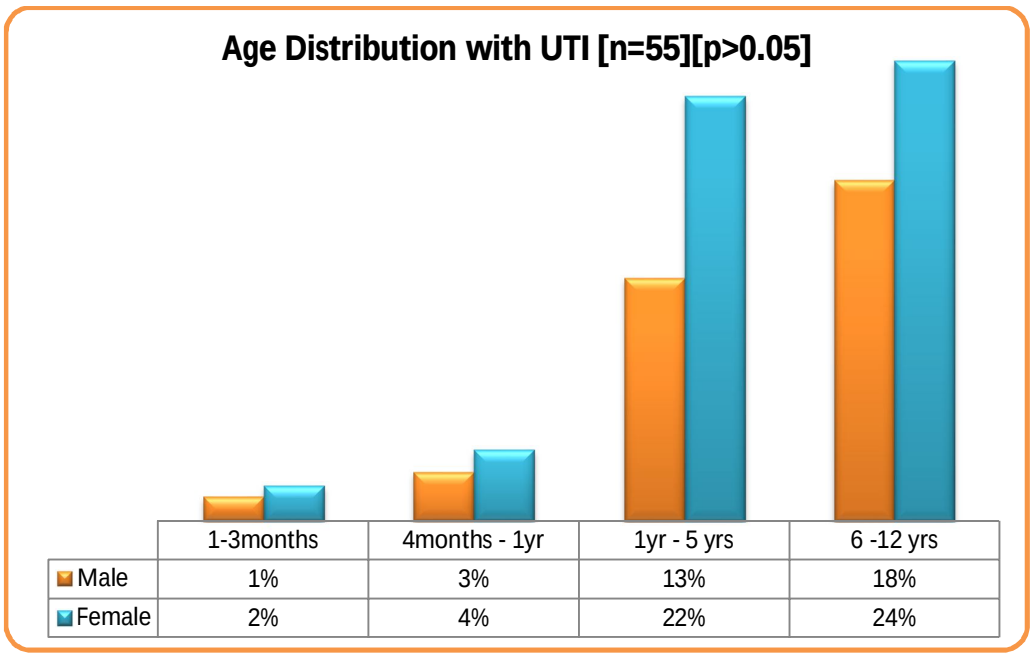
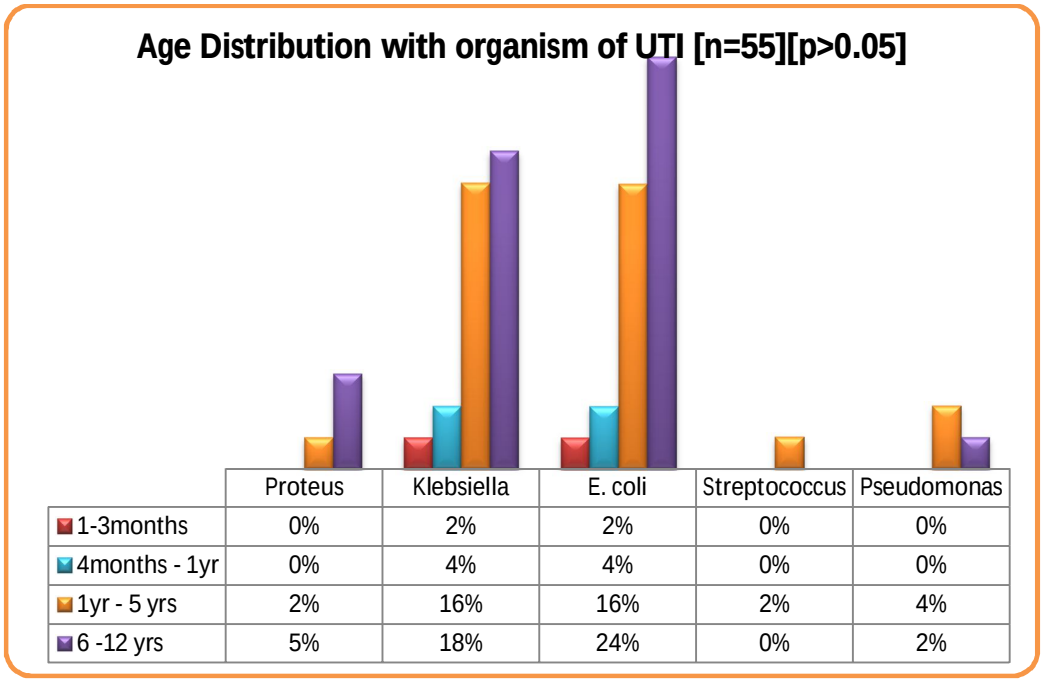


Table.17.Age Distribution with Organisms

Organism	1-3 months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	TOTAL	(%)
Proteus	0	0	1	3	4	7%
Klebsiella	1	2	9	10	22	40%
E. coli	1	2	9	13	25	45%
Streptococcus	0	0	1	0	1	2%
Pseudomonas	0	0	2	1	3	5%
Total	2	4	22	27	55	
(%)	4%	7%	40%	49%	100%	

Figure.22.Age Distribution with Organisms



	Proteus	Klebsiella	E. coli	Streptococcus	Pseudomonas
1-3months	0%	2%	2%	0%	0%
4months - 1yr	0%	4%	4%	0%	0%
1yr - 5 yrs	2%	16%	16%	2%	4%
6 -12 yrs	5%	18%	24%	0%	2%

Figure.23.Prevalence of Organisms in UTI

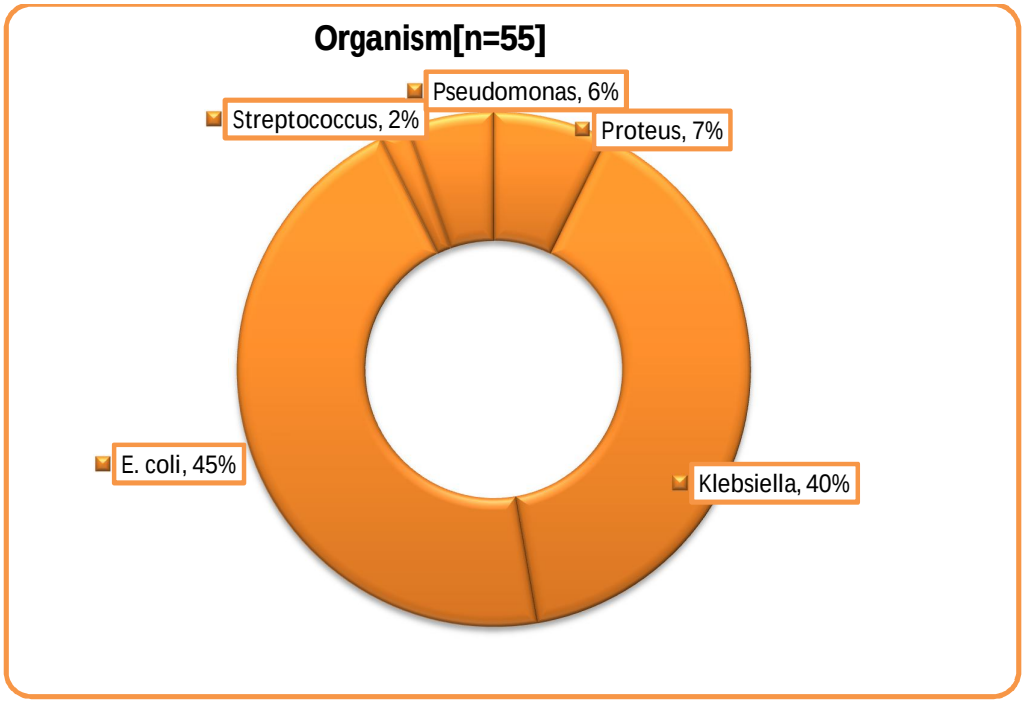


Table.18. Antibiotic Sensitivity Pattern of Organisms in UTI

	Proteus	Klebsiella	E. coli	Streptococcus	Pseudomonas
Cot	2	9	1	0	1
CN		0	0	0	0
G	2	14	18	0	2
Ak	3	21	23	0	3
Nx	2	16	15	0	2
Cip	1	13	15	0	2
Nit	2	9	20	1	1
Amx	0	4	1	0	0
E	0	0	0	0	0
Doxy	0	0	0	0	0
Ctx	1	20	9	0	1
Ctz	0	0	1	0	0
Cfs	3	18	20	0	1

Table.19. Antibiotic Sensitivity Pattern of Organisms in UTI

	Proteus [n=4]	(%)	Klebsiella [n=22]	(%)	E. Coli [n=25]	(%)	Strepto-coccus [n=1]	(%)	Pseudo-monas [n=3]	(%)
Cot	2	50%	9	41%	1	4%	0	0%	1	33%
CN		0%	0	0%	0	0%	0	0%	0	0%
G	2	50%	14	64%	18	72%	0	0%	2	67%
Ak	3	75%	21	95%	23	92%	0	0%	3	100%
Nx	2	50%	16	73%	15	60%	0	0%	2	67%
Cip	1	25%	13	59%	15	60%	0	0%	2	67%
Nit	2	50%	9	41%	20	80%	1	100%	1	33%
Amx	0	0%	4	18%	1	4%	0	0%	0	0%
E	0	0%	0	0%	0	0%	0	0%	0	0%
Doxy	0	0%	0	0%	0	0%	0	0%	0	0%
Ctx	1	25%	20	91%	9	36%	0	0%	1	33%
Ctz	0	0%	0	0%	1	4%	0	0%	0	0%
Cfs	3	75%	18	82%	20	80%	0	0%	1	33%

Table.20. Antibiotic Resistance Pattern of Organisms in UTI

	Proteus	Klebsiella	E. coli	Streptococcus	Pseudomonas
CN	1	5	2	0	0
CIP	3	15	13	1	1
Ctx	0	12	10	0	1
Nx	2	10	14	1	1
Nit	2	14	6	0	2
Cot	2	16	22	1	2
G	2	7	10	1	0
Ak	1	1	1	1	0
Ctz	0	2	1	0	0
Amx	3	18	24	1	1
Cfs	0	0	2	1	0

Table.21. Antibiotic Resistance Pattern of Organisms in UTI

	Proteus [n=4]	(%)	Klebsiella [n=22]	(%)	E. Coli [n=25]	(%)	Strepto-coccus [n=1]	(%)	Pseudo-monas [n=3]	(%)
CN	1	25%	5	23%	2	8%	0	0%	0	0%
CIP	3	75%	15	68%	13	52%	1	100%	1	33%
Ctx	0	0%	12	55%	10	40%	0	0%	1	33%
Nx	2	50%	10	45%	14	56%	1	100%	1	33%
Nit	2	50%	14	64%	6	24%	0	0%	2	67%
Cot	2	50%	16	73%	22	88%	1	100%	2	67%
G	2	50%	7	32%	10	40%	1	100%	0	0%
Ak	1	25%	1	5%	1	4%	1	100%	0	0%
Ctz	0	0%	2	9%	1	4%	0	0%	0	0%
Amx	3	75%	18	82%	24	96%	1	100%	1	33%
Cfs	0	0%	0	0%	2	8%	1	100%	0	0%

NEPHROTIC SYNDROME

Figure.24.Nephrotic Syndrome with Peritonitis

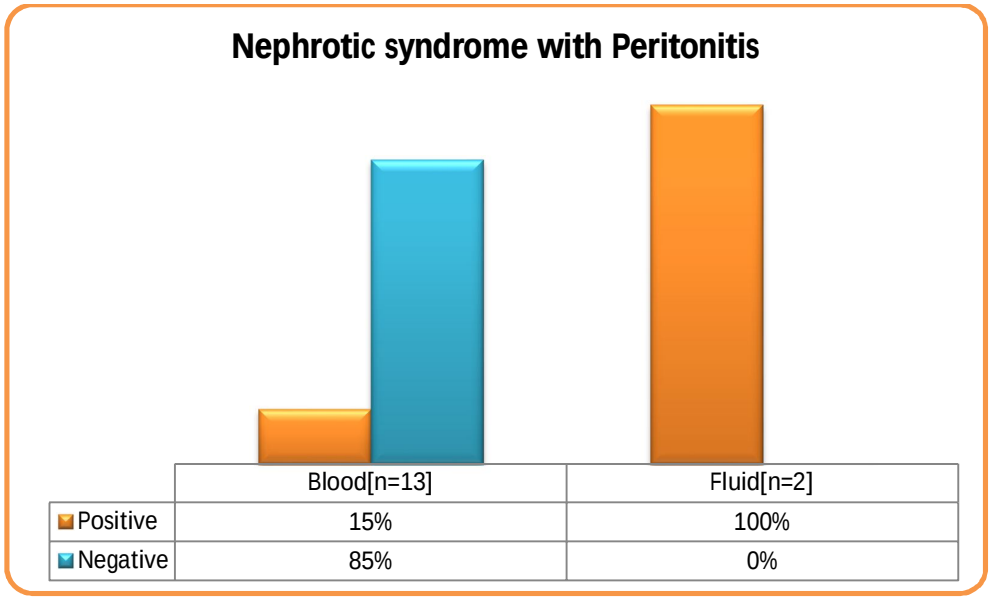


Table.22.Prevalence of Organisms in Blood Culture

AGE	MALE [n=10]				FEMALE[n=3]				TOTAL
	1-3 months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	1-3mon	4mon - 1yr	1-5 yrs	6-12 yrs	
Total			3	7			1	2	13
Positive				1				1	2
(%)	0%	0%	0%	10%	0%	0%	0%	33%	15%

Table.23.Prevalence of Organisms in Ascitic Fluid Culture

	MALE				FEMALE[n=2]				
AGE	**1-3 months**	**4months - 1yr**	**1yr - 5 yrs**	**6 -12 yrs**	**1-3mon**	**4mon - 1yr**	**1-5 yrs**	**6-12 yrs**	**TOTAL**
Total								2	2
Positive								2	2
(%)	0%	0%	0%	0%	0%	0%	0%	100%	100%

Table.24.Prevalence of Organisms in Blood and Ascitic Fluid Culture

	1-3months	**4months - 1yr**	**1yr - 5 yrs**	**6 -12 yrs**	**(%)**
Klebsiella-Blood [n=13]				2	15%
Klebsiella-Ascitic fluid [n=2]				2	100%

Figure.25. Antibiotic Sensitivity Pattern of Organisms in Blood

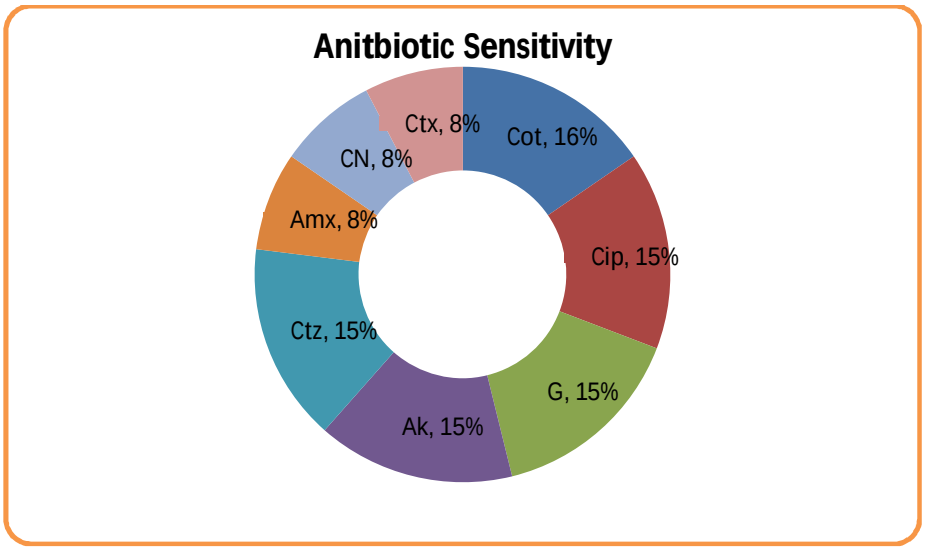


Figure.26. Antibiotic Sensitivity Pattern of Organisms in Blood

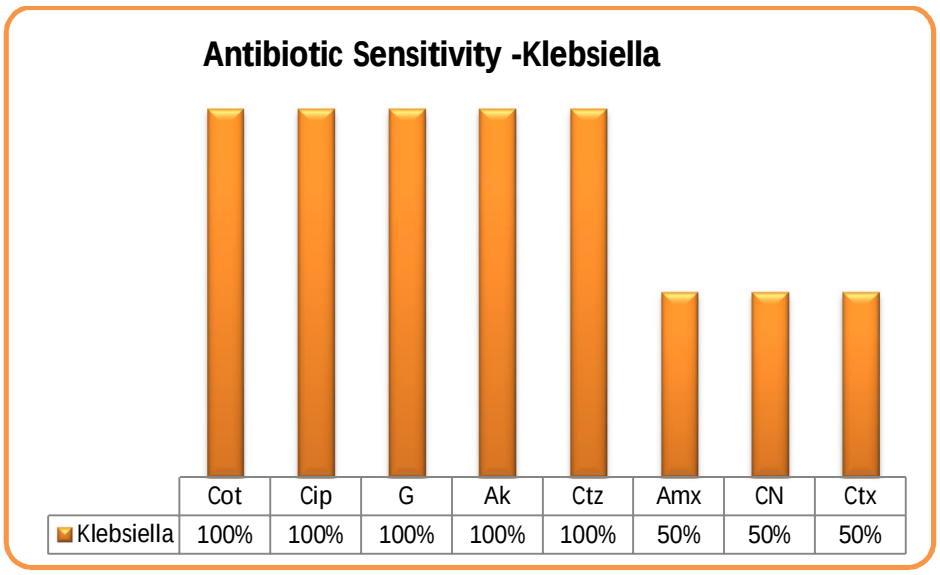


Figure.27. Antibiotic Resistance Pattern of Organisms in Blood

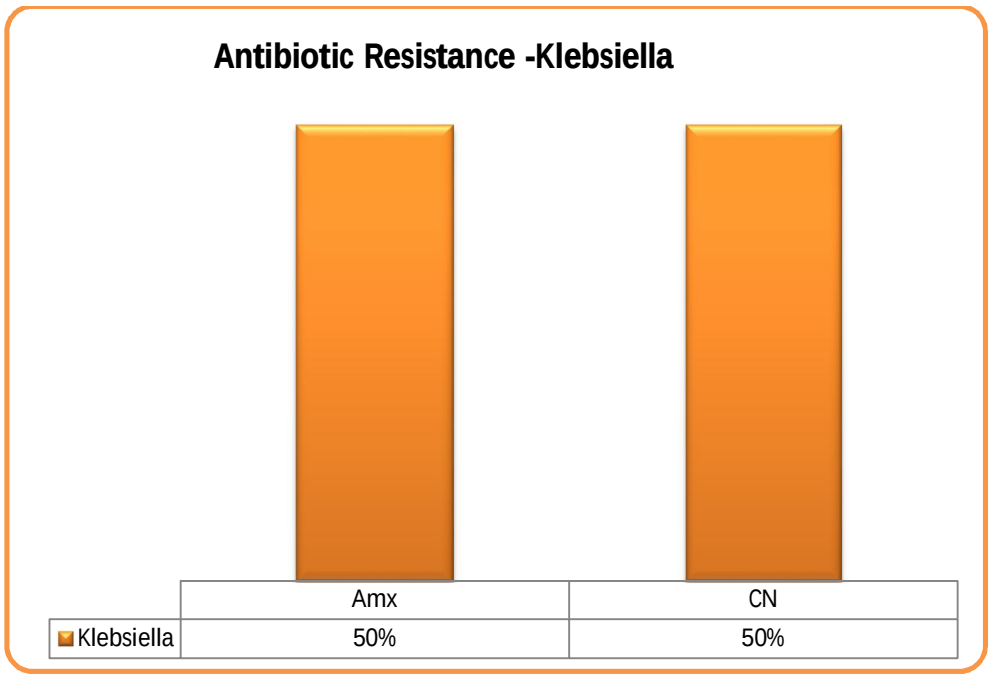


Table.25. Antibiotic Sensitivity Pattern of Organisms in Blood

Antibiotic Sensitivity		
Blood	**Klebsiella**	(%)
Cot	2	100%
Cip	2	100%
G	2	100%
Ak	2	100%
Ctz	2	100%
Amx	1	50%
CN	1	50%
Ctx	1	50%

Table.26. Antibiotic Resistance Pattern of Organisms in Blood

Blood	Klebsiella	(%)
Amx	1	50%
CN	1	50%

Table.27. Antibiotic Sensitivity Pattern of Organisms in Ascitic Fluid

Ascitic fluid	Klebsiella	(%)
Ak	2	100%
Cfs	1	50%
Cot	1	50%
Amx	0	0%
Cip	1	50%
G	1	50%
CN	1	50%
Ctx	2	100%
Ctz	1	50%

Figure.28. Antibiotic Sensitivity Pattern of Organisms in Ascitic Fluid

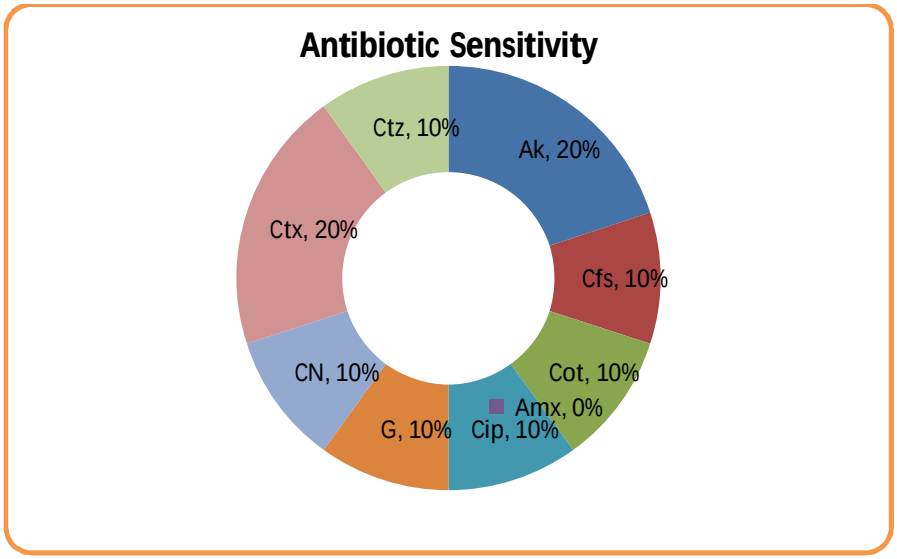


Table.28. Antibiotic Resistance Pattern of Organisms in Ascitic Fluid

Ascitic fluid	Klebsiella	(%)
Cip	1	50%
Amx	2	100%
Nx	2	100%
G	1	50%
Ctx	0	0%

Figure.29. Antibiotic Resistance Pattern of Organisms in Ascitic Fluid

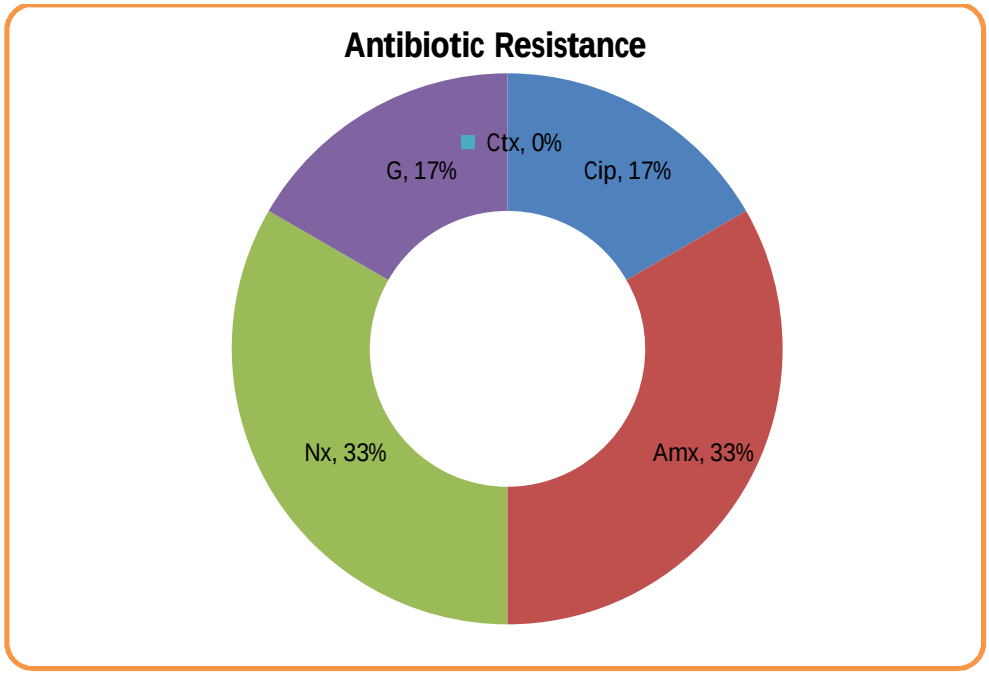


Figure.30. Antibiotic Sensitivity Pattern of Organisms in Ascitic Fluid

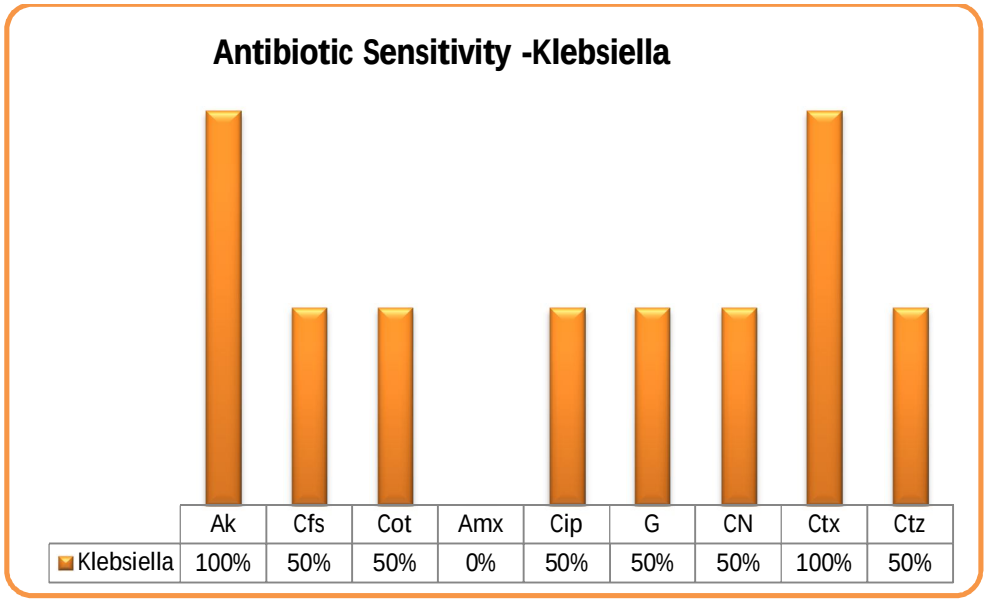
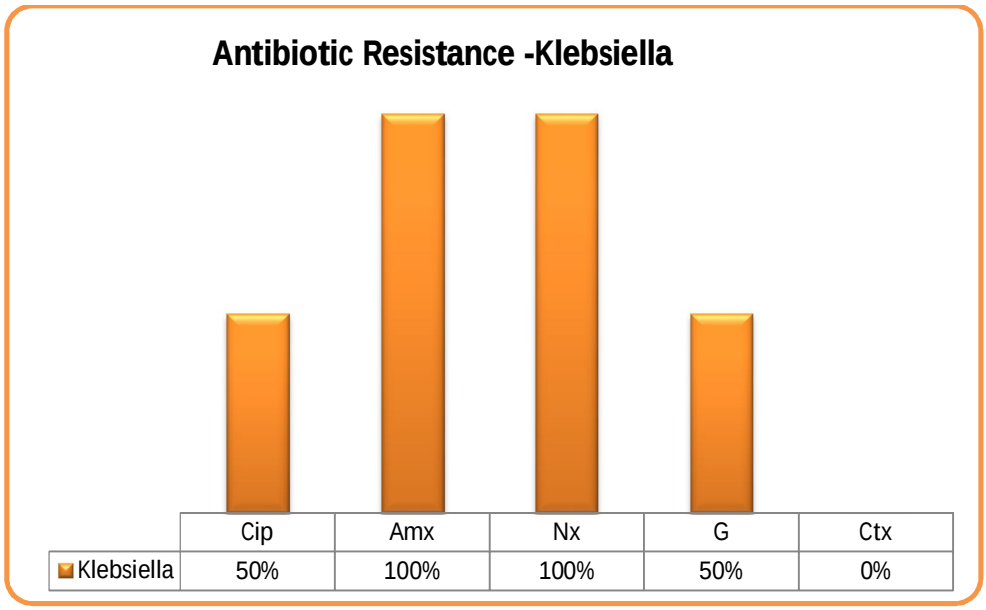


Figure.31. Antibiotic Resistance Pattern of Organisms in Ascitic Fluid



ACUTE CNS INFECTION

Table.29. Age and Gender Distribution of Acute CNS infection

AGE	MALE [n=45]				FEMALE[n=38]				TOTAL
	1-3 months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	1-3mon	4mon - 1yr	1-5 yrs	6-12 yrs	
Total	4	8	15	18	4	7	11	16	83
Positive		1	1						2
(%)	0%	2%	2%	0%	0%	0%	0%	0%	2%

Table.30. Age Distribution of Acute CNS infection

1-3months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	6 -12 yrs	(%)
Klebsiella	1	1			2%

Table.31.Antibiotic Sensitivity Pattern of Organisms

Antibiotic Sensitivity		
	Klebsiella	(%)
Cip	2	100%
Of	2	100%
Cot	1	50%
Genta	1	50%
Ctx	2	100%
Ctz	1	50%
Ak	1	50%

Figure.32.Antibiotic Sensitivity Pattern of Organisms

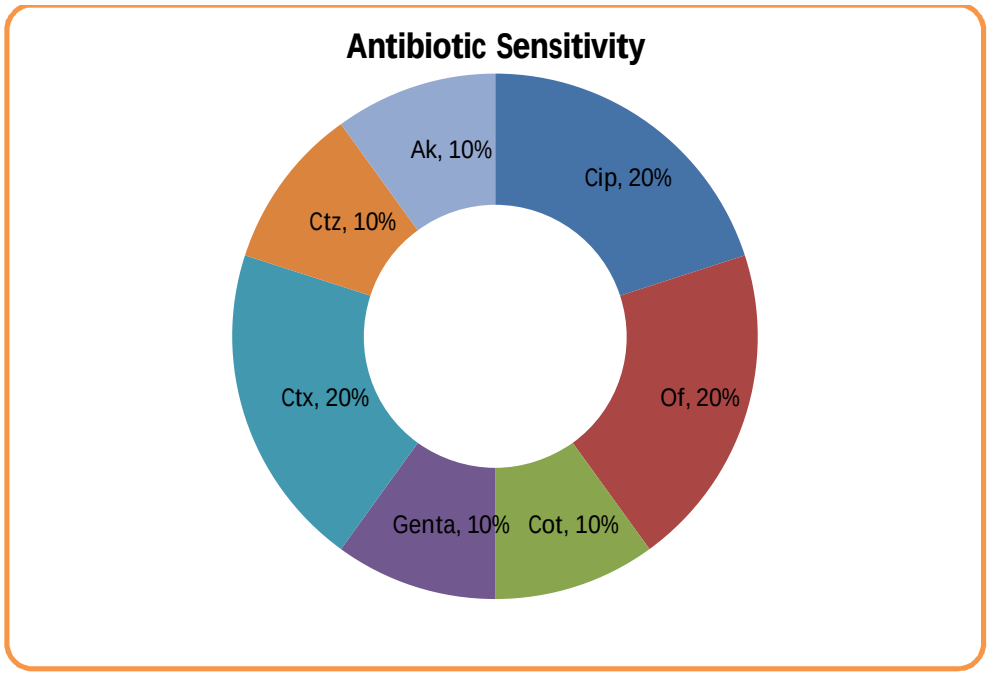


Figure.33.Antibiotic Sensitivity Pattern of Organisms

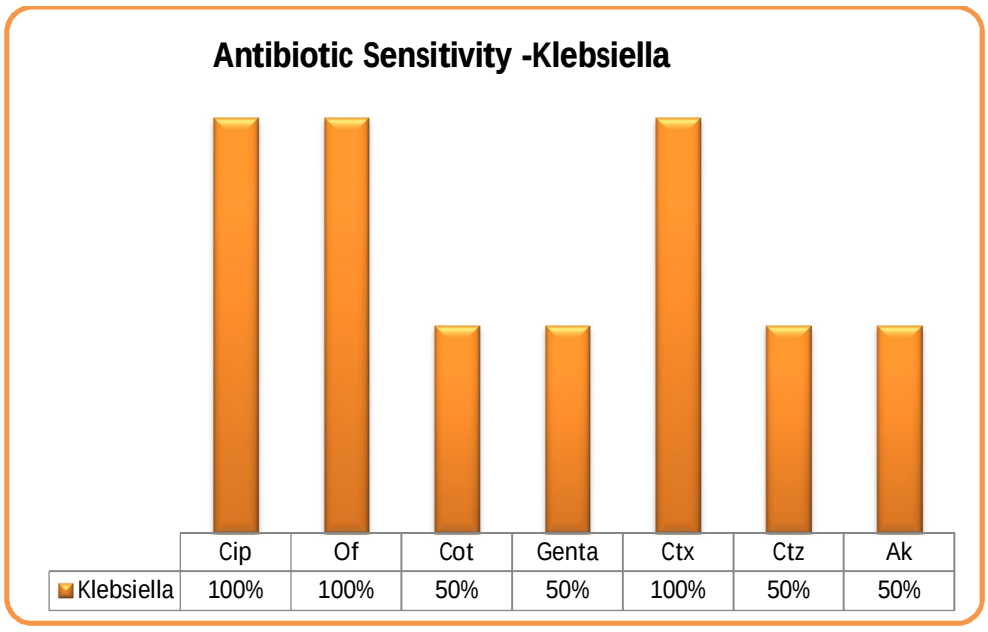


Table.32.Antibiotic Resistance Pattern of Organisms

Antibiotic Resistance		
	Klebsiella	(%)
CN	1	50%
Cot	1	50%
Ctx	0	0%
G	1	50%

Figure.34.Antibiotic Resistance Pattern of Organisms

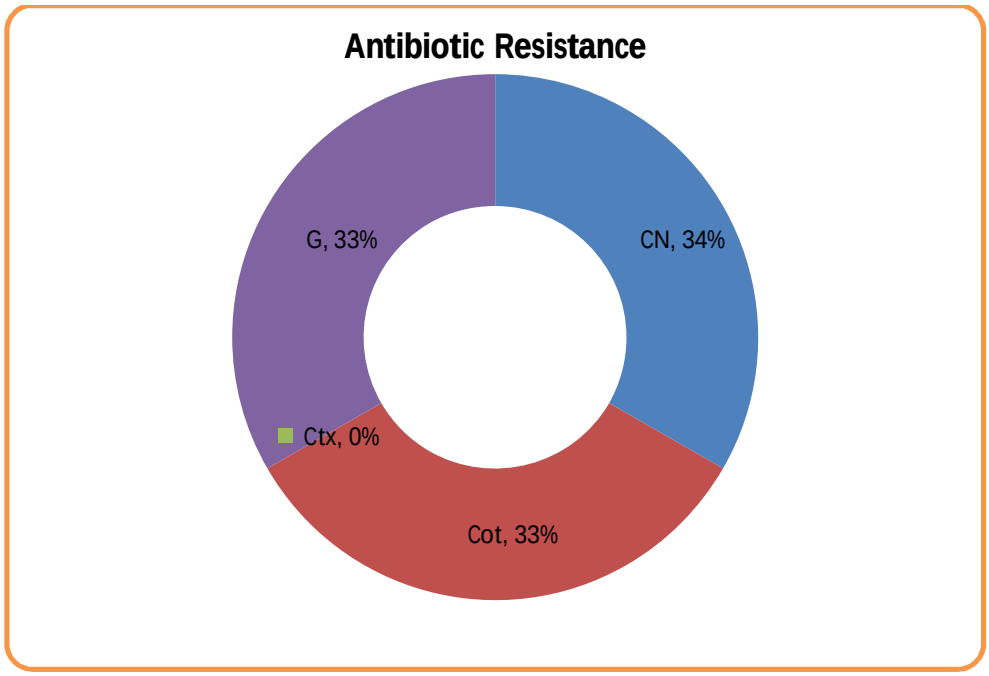
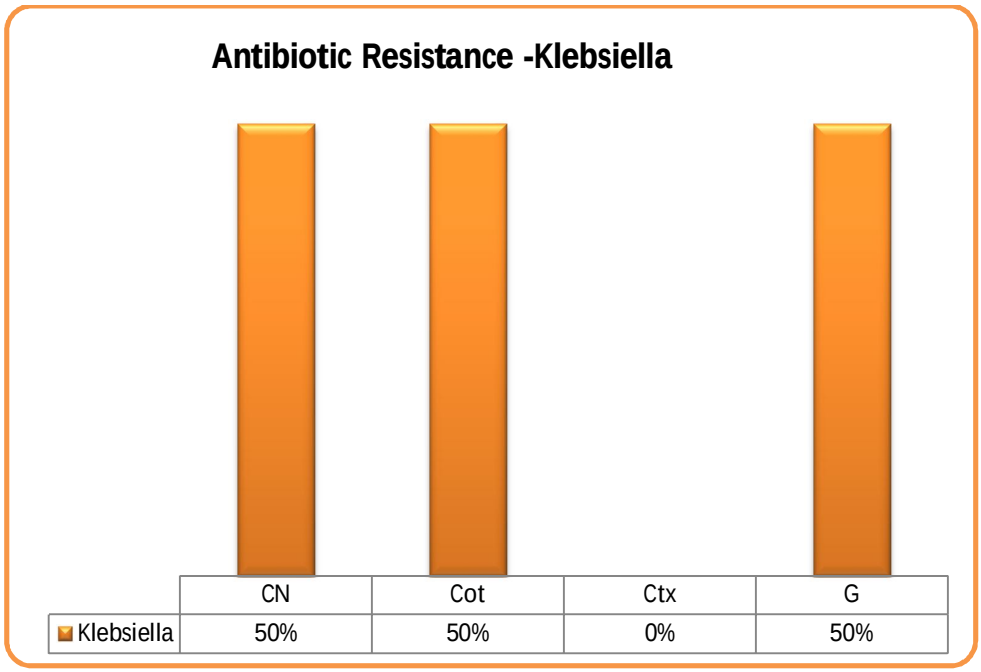


Figure.35.Antibiotic Resistance Pattern of Organisms



BRAIN ABSCESS

Table.33.Age and Gender Distribution of Organisms

AGE	MALE				FEMALE[n=2]				TOTAL
	1-3 months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	1-3mon	4mon - 1yr	1-5 yrs	6-12 yrs	
Total							1	1	2
Positive							1		1
(%)	0%	0%	0%	0%	0%	0%	2%	0%	50%

Table.34.Prevalence of Organisms

	1-3months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	(%)
Staph aureus			1		50%

Table.35.Antibiotic Sensitivity Pattern of Organisms

Drugs	Staph aureus	(%)
CN	0	0%
Ak	1	100%
Cfs	1	100%
Doxy	1	100%
Ctx	1	100%
Ctz	1	100%
E	1	100%
G	1	100%

Figure.36.Antibiotic Sensitivity Pattern of Organisms

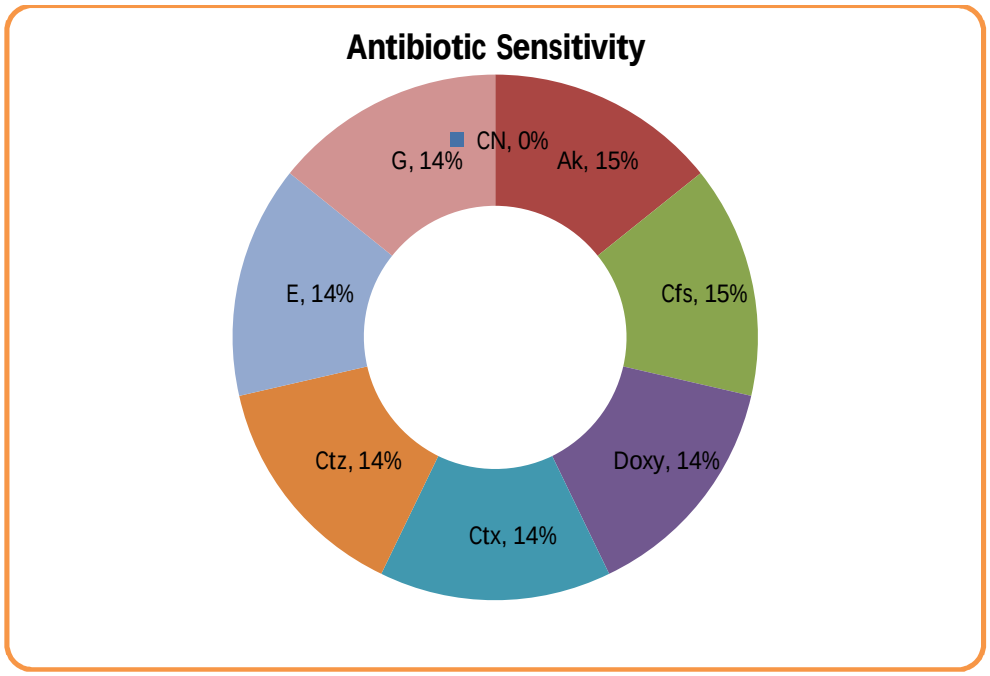


Figure.37.Antibiotic Sensitivity Pattern of Organisms

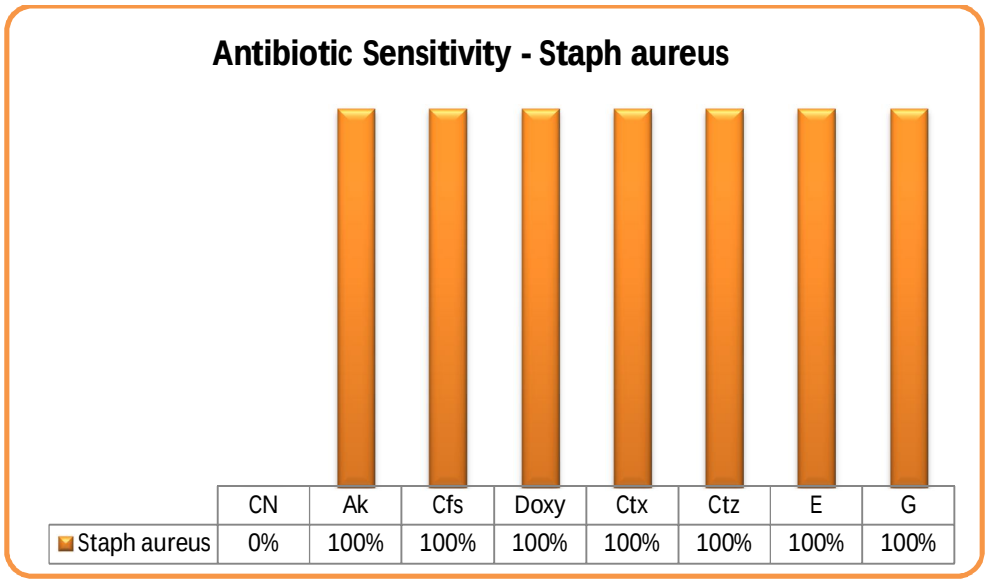


Figure.38.Antibiotic Resistance Pattern of Organisms

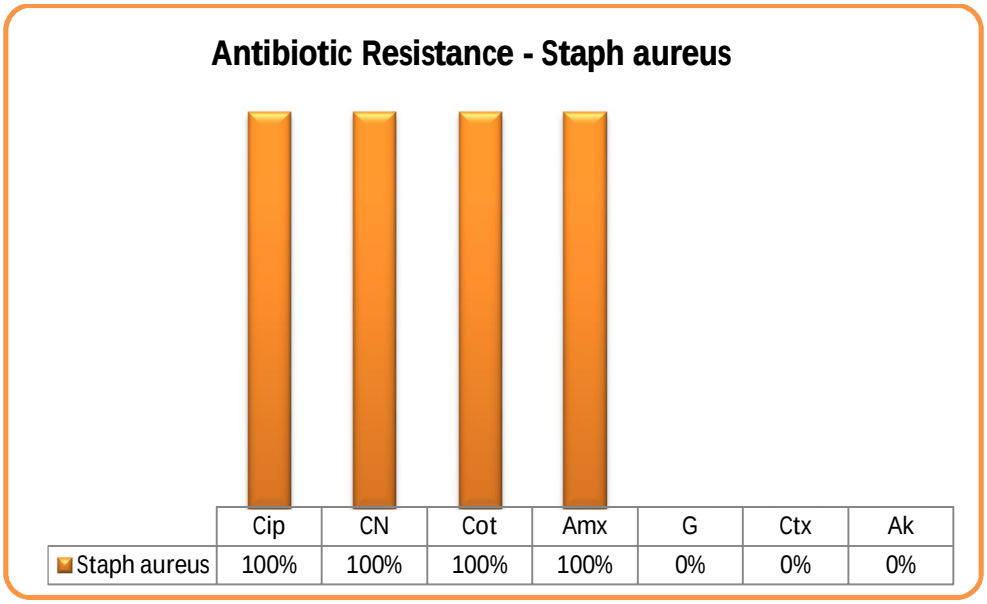


Table.36.Antibiotic Resistance Pattern of Organisms

Drugs	Staph aureus	Staph aureus
Cip	1	100%
CN	1	100%
Cot	1	100%
Amx	1	100%
G	0	0%
Ctx	0	0%
Ak	0	0%

SKIN AND SOFT TISSUE INFECTIONS

Table.37.Age and Gender Distribution

AGE	MALE [n=7]				FEMALE[n=3]				TOTAL
	1-3 months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	1-3mon	4mon - 1yr	1-5 yrs	6-12 yrs	
Total			5	2			2	1	10
Positive			2	1			2		5
(%)	0%	0%	29%	14%	0%	0%	67%	0%	50%

Table.38.Agewise Distribution of Organisms

1-3months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	(%)
Staph aureus		4	1	50%

Figure.39.Antibiotic Sensitivity Pattern of Organisms

Drugs	Staph aureus	(%)
CN	1	20%
Ak	3	60%
Cfs	1	20%
Doxy	1	20%
Ctx	3	60%
Ctz	1	20%
E	2	40%
G	2	40%

Table.40.Antibiotic Resistance Pattern of Organisms

Drugs	Staph aureus	(%)
G	3	60%
Cip	4	80%
CN	4	80%
Cot	4	80%
Amx	3	60%
Ctx	0	0%
Ak	1	20%

Figure.39.Antibiotic Sensitivity Pattern of Organisms

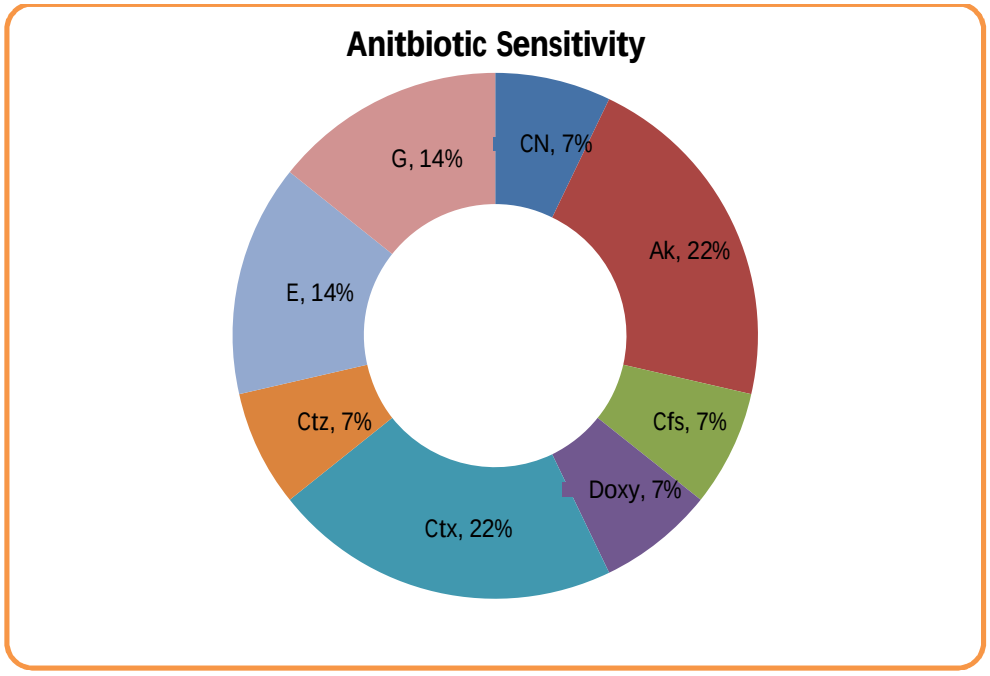


Figure.40.Antibiotic Resistance Pattern of Organisms

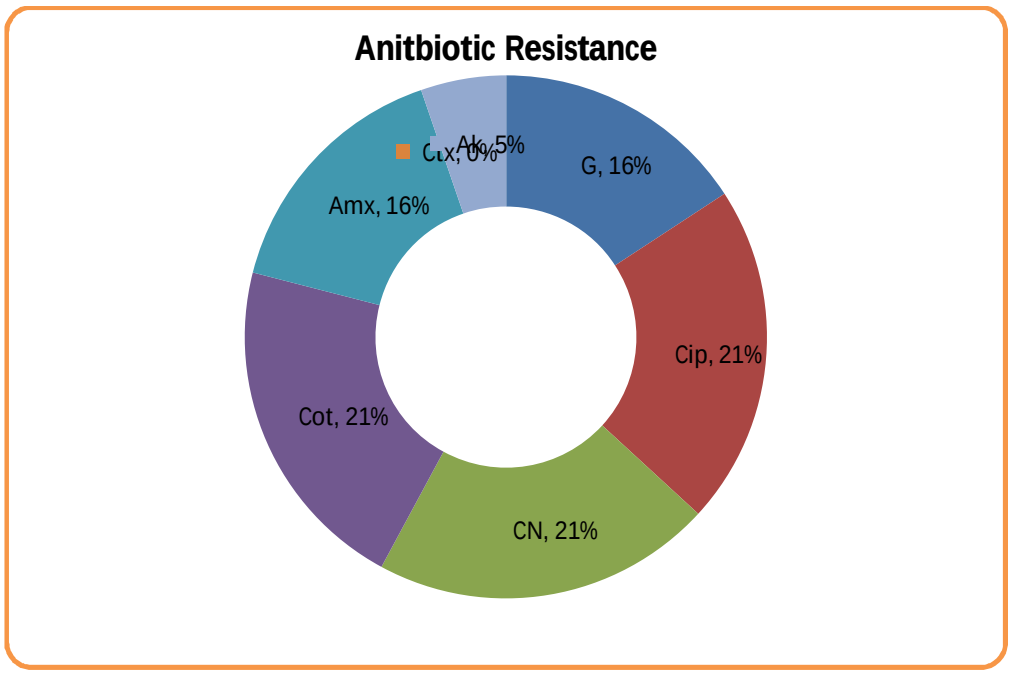


Figure.41.Antibiotic Sensitivity Pattern of Organisms

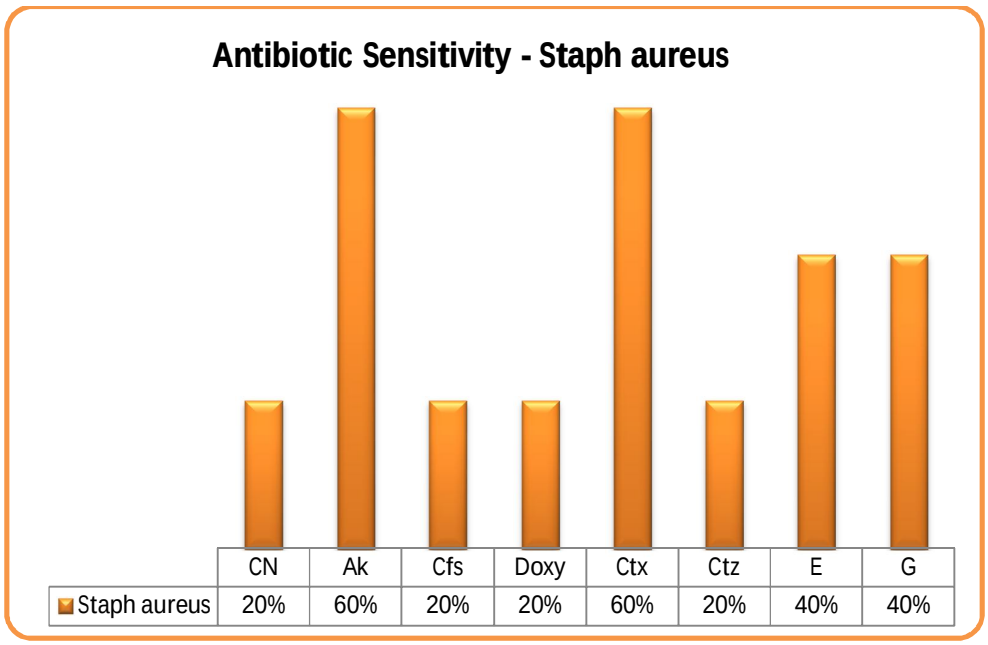
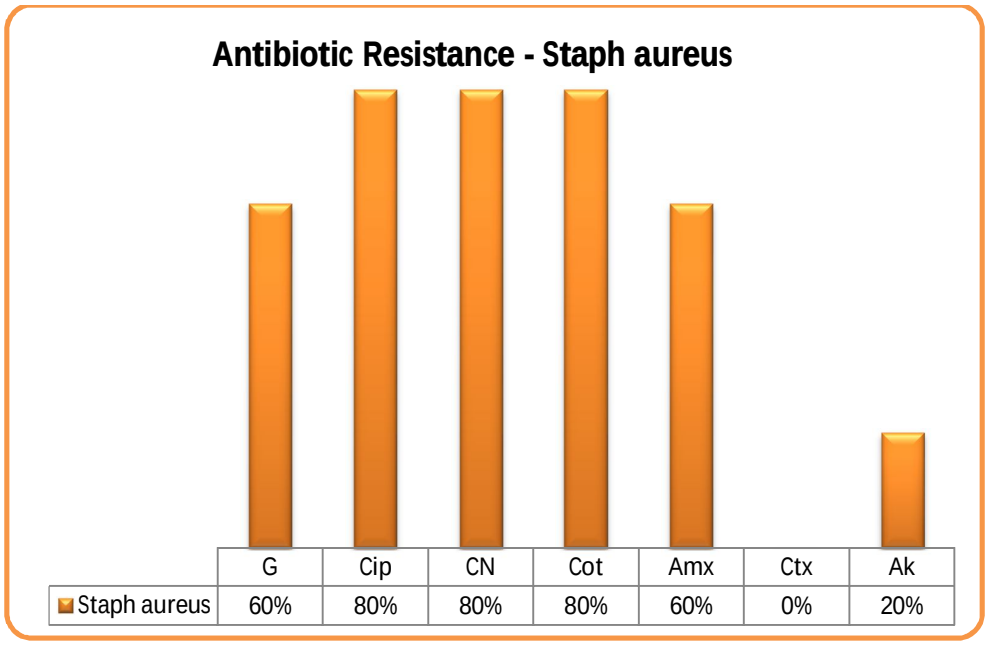


Figure.42.Antibiotic Resistance Pattern of Organisms



ACUTE GASTROENTERITIS WITH SEPTIC SHOCK

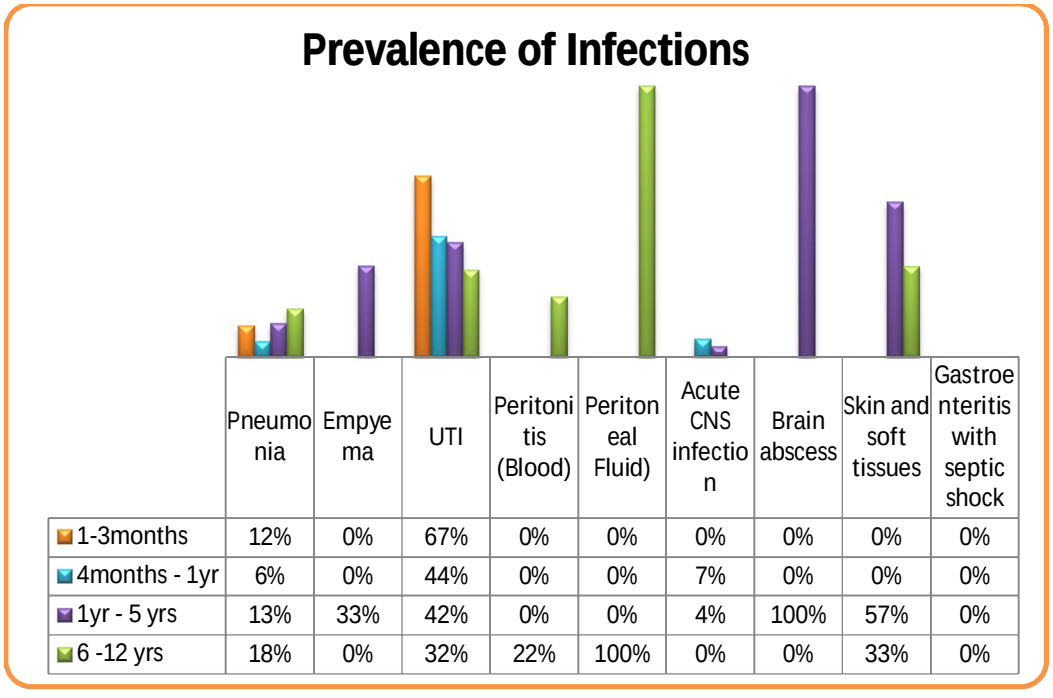
Table.41.Age and Gender Distribution of Acute Gastroenteritis with Septic Shock

AGE	MALE [n=9]				FEMALE[n=10]				TOTAL
	1-3 months	4months - 1yr	1yr - 5 yrs	6 -12 yrs	1-3mon	4mon - 1yr	1-5 yrs	6-12 yrs	
Total		2	4	3	4	1	4	1	19
Positive									
(%)	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table.42.Prevalence of Infection with Age Distribution

Age	Pneumonia	Empyema	Urinary Tract Infection	Nephrotic syndrome with Peritonitis (Blood)	Nephrotic syndrome with Peritonitis (Peritoneal Fluid)	Acute CNS infection	Brain abscess	Skin and soft tissues	AGE with septic shock
1-3 months	2	0	2	0	0	0	0	0	0
4months - 1yr	3	0	4	0	0	1	0	0	0
1yr - 5 yrs	6	1	22	0	0	1	1	4	0
6 -12 yrs	5	0	27	2	2	0	0	1	0

Figure.43.Prevalence of Infection with Age Distribution



RESULTS

This study was conducted to estimate the prevalence of organisms in patients admitted in pediatric intensive care unit and to estimate their culture and sensitivity pattern.

424 children were included in the study. Relevant data were obtained from the history, physical examination of the patients and the hospital records. Appropriate samples were obtained and were sent for culture and sensitivity.

The study included 234 males and 190 females. About 39% of the study population included children in the 6-12 years age group.

Overall positivity accounts for 20% of the population included in the study. Prevalence of culture positive sepsis was more in the 1-5 years age group of children.

Among the 144 cases of pneumonia included in the study 11% were culture positive. Prevalence of pneumonia was more in the 4 months to 5 years age group. Singh.V et.al studies shows that the burden of pneumonia is more among children under five age group. More than half of the cases of pneumonia occur in the under five age group. Culture positive pneumonia was high among under five age group and that too

among male children. The most common organisms grown were Klebsiella and Coagulase negative Staphylococcus. Other organisms were Staphylococcus aureus and Proteus. Klebsiella pneumonia was more sensitive to Cefotaxime, Amikacin. It was resistant to Amoxycillin, Ciprofloxacin and Cotrimoxazole. Staphylococcus aureus was sensitive to Gentamycin and Cefotaxime. It was resistant to Amoxycillin.

Out of 3 samples of Empyema, one was positive. All of them were in the under five age group. According to Freij BJ et.al study Empyema is more common in the under five age group. According to Baranwal et.al studied Staphylococcus aureus is more common.One sample was positive for Staphylococcus aureus. It was sensitive to Cefotaxime and Gentamycin. It was resistant to Amoxycillin.

83 samples of Acute Central Nervous system infection were studied. Prevalence of infection was more in males than in females. Children in the age group of 6-12 years were more affected. Two samples were positive for Klebsiella species. It was sensitive to Cefotaxime and Ofloxacin. It was resistant to Cephalexin, Cotrimoxazole and Gentamycin.

Two cases of Brain abscess was included in the study. Both the samples were females. According to Saez-Lloreus et.al studies Staphylococcus aureus is the common organism. One sample was positive for Staphylococcus aureus. It was sensitive to Cefotaxime and Amikacin. It was resistant to Amoxycillin.

The study included 148 cases of Urinary Tract infection. Out of that 55 samples were positive. Prevalence of UTI was more common in the 6-12 years age group. Infection was more common in males in the age of 6-12 years followed by females in the 6-12 year age group. The most prevalent organism was Escherichia coli. In a study by Elder JS et.al Escherichia coli is the common organism. According to Joel-C-Boggar et.al study Escherichia coli is common in UTI, which was sensitive to Amikacin. It was sensitive to Amikacin and Nitrofurantoin. Escherichia coli was resistant to cotrimoxazole and Amoxycillin. According to Joel-C-Boggar et.al study Escherichia coli is resistant to cotrimoxozole. The next common organism was Klebsiella species. It was sensitive to Amikacin, Cefaperazone sulbactum and Norfloxacin. It was resistant to Amoxycillin and Cotrimoxazole. In Shaik N et.al study , E.coli was more common in children with Urinary Tract Infection.

Thirteen cases of Nephrotic syndrome with peritonitis were studied. Prevalence was more in males. Children in the 6-12 years age group were more affected. Out of the thirteen cases, four were positive. Two samples of blood culture were positive for Klebsiella. Two samples of ascitic fluid were positive for Klebsiella. The organism was sensitive to Cefotaxime and Amikacin. It was resistant to Amoxycillin. In the study conducted in Children's medical centre and Parkland Memorial Hospital, gram negative organism were isolated from 3% of patients.

A total of Nineteen cases of Acute Gastroenteritis with septic shock was included in the study. None of them were culture positive.

Ten cases of skin and soft tissue infection were studied. Prevalence was more in male children. Children in the age group of 1- 5 years were commonly affected. All the samples were positive for Staphylococcus aureus.In the study conducted by Bernald et.al Staphylococcus aureus infection was more common in skin and soft tissues. It was sensitive to Gentamycin and Cefotaxime. It was resistant to Amoxycillin and Cotrimoxazole.

CONCLUSION

1) The present study reflects the prevalence of Organisms and their Culture and Sensitivity pattern in the Pediatric Intensive Care Unit in a Tertiary Care Hospital.

2) The Prevalence of Culture positive infections accounted for 20% of the study population.

3) The Prevalence of Culture positive infections was more common in the under 5 age group.

4) Urinary Tract Infections were more common followed by Pneumonia.

5) Gram Negative Organisms were more common in the Pediatric Intensive Care Unit.

6) The Study showed that Organisms were sensitive to Aminoglycosides and third generation Cephalosporins.

7) Resistance rates were high to Amoxycillin, Cotrimoxazole and Cephalexin.

8) Staphylococcus aureus infections were more common in Skin and Soft tissue infections.

9) In a nutshell , “Right Indication, Right Antibiotics, Right Dose, Right Route and Right Duration” are the key pillars of rational antibiotic therapy. “Antimicrobial Resistance-No action today, No cure tomorrow”

SUMMARY

This one year prospective study was done to estimate the prevalence of organisms in patients admitted in the Pediatric Intensive Care Unit and to estimate their culture and sensitivity pattern in Coimbatore Medical College Hospital.

424 children who satisfied the inclusion criteria were included in the study, which included 234 males and 190 females. 20% of the study population included were culture positive. The prevalence of culture positivity is more in the under 5 age group.

In the study Klebsiella infections were more common in pneumonia . It was sensitive to Aminoglycosides and third generation cephalosporin cefotaxime and Resistant to Cotrimoxazole, Amoxycillin and Ciprofloxacin. Staphylococcal infections were more common in empyema, brain abscess and soft tissue infections. It was sensitive to Cefotaxime and Resistant to Amoxycillin and Cotrimoxazole.

E.coli was more common in Urinary Tract Infections which was sensitive Amikacin and Resistant to Cotrimoxazole.

The rule of thumb is to identify the organism and administer the appropriate antibiotics.

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ANNEXURES

PROFORMA

COIMBATORE MEDICAL COLLEGE

DEPARTMENT OF PEDIATRICS

PARTICULARS

Name & Address:

Age/Sex:

DOA:

DOD:

Duration of Hospital Stay:

Diagnosis:

Any prehospital treatment(details):

Investigation Done:

Antibiotics/surgical interventions:

Sample Collected:

Clinical Profile:

Presenting symptoms

Clinical Diagnosis at admission:

Details of the Specimen:

Specimen:

Organism:

Sensitivity:

CONSENT FORM

ஒப்புதல் படிவம்

உங்களது குழந்தை . _____, வயது _____ ,

தந்தை / பெயர் _____, வசிக்குமிடம் _____ _____

கோயம்புத்தூர் மருத்துவக் கல்லூரி மருத்துவமனை குழந்தைகள் நலப் பிரிவில் பட்ட மேற்படிப்பு பயிலும் மரு. ப.மேனகா அவர்களின் ஆய்வுக்கு குழந்தைகள் தீவிர சிகிச்சைப் பிரிவில் (PICU) அனுமதிக்கப்பட்டிருக்கும் உங்களது குழந்தை _____ வயது _____ தகுதியுடையவராக உள்ளார். எனவே இந்த ஆய்வு சம்மந்தமான சந்தேகங்களை கேட்டுத் தெரிந்துகொள்ளலாம். அவரிடம் இந்த ஆய்வு பற்றி எந்த விளக்கமும் பெற முடியும்.

ஆராய்ச்சி தலைப்பு :

குழந்தைகள் தீவிர சிகிச்சைப் பிரிவில் (PICU) அனுமதிக்கப்பட்டிருக்கும் குழந்தைகளை தாக்கும் நுண்ணுயிர் கிருமிகள் மற்றும் கட்டுப்படுத்தக்கூடிய மருந்துகள்.

ஆராய்ச்சி நோக்கம் :

கிருமி தாக்குதல் - தீவிர சிகிச்சைப் பிரிவில் (PICU)

அனுமதிக்கப்பட்டிருக்கும் குழந்தைகளின் இறப்பிற்கு முக்கிய காரணங்களுள் ஒன்று. பல சமயங்களில் குழந்தைகள் தங்களுடைய முதன்மையான நோயிலிருந்து வெளிவந்தாலும், கிருமி தாக்குதலால் இறக்க நேரிடுகின்றது. எனவே இதனை கட்டுப்படுத்த, நுண்ணுயிர் கிருமிகள் கண்டறிதல், மற்றும் அதற்கான சரியான kUe J ஆகியவற்றை அறிவதே ஆய்வின் நோக்கம்.

ஆராய்ச்சி செயல்முறைகள் :

உரிய ஒப்புதல் படிவம் பெற்றவுடன் குழந்தைகளின் மருத்துவ தகவல்கள் மற்றும் உடல் ஆய்வு ஆவனங்கள் குறித்த தகவல்கள் ஆய்வாளரால் சேகரிக்கப்படும்.

இக்குழந்தைகளிடமிருந்து பெறப்படும் இரத்தம் மற்றும் இதர திரவங்கள் (சிறுநீர்) நுண்ணுயிர் கிருமி ஆய்வகத்திற்கு அனுப்பப்படும், கிருமிகள் மற்றும் அதற்கான மருந்துகள் அறியப்படும்.

ஆய்விலிருந்து விலகுதல்:

இந்த ஆய்வில் பங்கு முற்றிலும் தன்னார்வ மற்றும் தனியரின் விருப்பமே, மற்றும் நீங்கள் விருப்பமில்லையெனில் விலகிக்கொள்ள உரிமை உண்டு,

தனியுரிமை பேணப்படுதல்:

உங்கள் ஆய்வின் போது, நீங்கள் வழங்கிய எந்த தகவல்களும் இரகசியமாக வைக்கப்படும் என்று உறுதி கூறுகிறேன்.

முடிவுகளை வெளியிட அங்கீகாரம்:

ஆய்வு முடிவுகள் அறிவியல் நோக்கங்களுக்காக வெளியிடப்பட அனுமதிக்கிறேன். எந்த t|j j j|Y k உங்கள் அடையாளத்தை வெளிப்படுத்தமாட்டோம், உங்கள் தகவல்களும் இரகசியமாக வைக்கப்படும்,

ஒப்புதல் அறிக்கை

._____ ஆகிய நான், எனது குழந்தை _____ மரு. ப.மேனகா அவர்களின் ஆய்வில் கலந்து கொள்ள ஒப்புதல் படிவத்தினை நான் முழுவதும் படித்தேன் (அல்லது) அதை படித்து முற்றிலும் எனக்கு விளக்கினார் . இந்த ஆய்வு விவரங்கள் முழுமையாக நான் அறிந்து இருக்கிறேன்.

பெற்றோர் / பாதுகாவலர்

கையொப்பம் / இடது பெருவிரல் ரேகை

இடம்: கோயம்புத்தூர்

நாள்:

சாட்சி

கையொப்பம் / இடது பெருவிரல் ரேகை மற்றும் பெயர்

இடம்: கோயம்புத்தூர்

நாள்:

MASTER CHART

S.No.	Name	Age/Sex	Diagnosis	specimen	Blood	Sensitivity	Resistance
1	Mithun	5months/M	Acute CNS infection	Blood/CSF	No growth		
2	keerthan	11months/Mch	Bronchopneumonia	Blood	No growth		
3	Dhanusraj	12yrs/Mch	UTI	Urine	No growth		
4	Lakshana	9yrs/Fch	UTI	Urine	Proteus	Ak,G,Cip,Nx,Nit,cot	CN
5	Madhan kumar	8yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
6	Dhangeswari	7yrs/Fch	UTI	Urine	No growth		
7	Vijaykrishnan	2yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
8	Jeevika	6yrs/Fch	UTI	Urine	No growth		
9	Sayan	3yrs/mch	Bronchopneumonia	Blood	No growth		
10	Logesh	4mths/MCH	Bronchopneumonia/ Sepsis	Blood	Blood		
11	Kathir	10yr/M	Acute CNS infection	Blood/CSF	No growth		
12	Nithya sree	5yrs/ F	Pneumonia	Blood	No growth		
13	B/o Rukmani	32days/F	AGE with septic shock	Stool	No growth		
14	Ashif	11yrs/M	UTI	Urine	No growth		
15	Darshana	8yrs /F	UTI	Urine	No growth		
16	yaswanth	2mths/Mch	Bronchopneumonia	Blood	No growth		
17	Aswitha	7yrs/Fch	UTI	Urine	Klebsiella	Cfs/Nit/Cip/Ctx	CN,Nx
18	Surath	2yrs/mch	UTI	Urine	No growth		
19	Danuska Devi	5months/F	Acute CNS infection	Blood/CSF	No growth		
20	Sruthi	6yrs/F	UTI	Urine	No growth		
21	Sriram	11yrs/M	Pneumonia	Blood	No growth		
22	Sujitha	10yrs/F	UTI	Urine	E.coli	Nx,Cip,G,Ami,Ctz	Nit,Cot,CN
23	Prithik saran	2yrs/M	Bronchopneumonia	Blood	No growth		
24	Bhuvaneswari	7Yrs/F	UTI	Urine	No growth		
25	Akshaya	11yrs/Fch	UTI	Urine	No growth		

26	Nishan Kumar	2 1/2mnths/M	UTI	Urine	Klebsiella	Cfs,Ak,Ctx,G	Cot,CN,Nx,Cip
27	Priyadarshini	8 yrs/Fch	Nephrotic Syndrome	Blood	No growth		
28	Josphina	7yrs/F	Acute CNS infection	Blood/CSF	No Growth		
29	Lohith	2yrs/ M	Acute CNS infection	Blood/CSF	Klebsiella specie	Cip,Of,G,Ctx,Ctz	Cot ,CN
30	Jegadeesh	4 months/Mch	Bronchopneumonia	Blood	No growth		
31	Dhanya	4 yrs /F	UTI	Urine	No growth		
32	Saran	9yrs/M	UTI	Urine	No growth		
33	Vinitha	9yrs/Mch	Pneumonia	Blood	No growth		
34	Jayakumar	4 yrs/Mch	Pneumonia	Blood	No growth		
35	Dharanidaran	11months/Mch	urinary tract infection	Urine	Klebsiella	Cip,Of,Ak	CN,Cot,Ctx,G
36	Rohith	3yrs/mch	UTI	Urine	No growth		
37	Vijay	7yrs/Mch	Pneumonia	Blood	Kleb Pneumonia	Cip,Of,G,AK,Ctx	CN,Cot
38	Sneha	11yrs/Fch	Acute CNS infection	Blood/CSF	No growth		
39	B/o Revathy	43 days/Fch	Bronchopneumonia	Blood	No growth		
40	Deepak	3yrs/Mch	UTI	Urine	No growth		
41	Mukesh	3yrs/Mch	UTI	Urine	No growth		
42	Divya darshini	1yr/Fch	UTI	Urine	No growth		
43	Sivamani	12yrs/Mch	UTI	Urine	No growth		
44	Shankara	58days/Mch	Acute CNS infection	Blood/CSF	No growth		
45	Indumathi	12yrs/Fch	UTI	Urine	No growth		
46	Rithumathi	7yrs/Fch	UTI	Urine	No growth		
47	Subashini	4yrs/Fch	UTI	Urine	No growth		
48	Sakthi	4yrs/Mch	UTI	Urine	No growth		
49	Sankar	3yrs/Mch	Gluteal abscess	Blood,Pus	No growth		
50	Divisha	2months/Fch	Acute CNS infection	Blood/CSF	No growth		
51	Hariprasad	2yrs/Mch	Nephrotic syndrome	Blood	no growth		
52	Gopalakrishnan	74days/Mch	Acute CNS infection	Blood/CSF	No growth		

53	Mathiazhagan	11months/Mch	UTI	Urine	No growth		
54	Althaf	4yrs/Mch	Bronchopneumonia	Blood	No growth		
55	Manojkumar	9yrs/Mch	UTI	Urine	No growth		
56	Supriya	3yrs/Fch	UTI	Urine	No growth		
57	Karthikeyan	5yrs/Mch	AGE with septic shock	Stool	No growth		
58	Siva	12yrs/Mch	Nephrotic syndrome	Blood	No growth		
59	Nishanth	1yr/Mch	Bronchopneumonia	Blood	No growth		
60	Keerthi	4 months/Fch	Bronchopneumonia	Blood	No growth		
61	Tharshan	2yrs/Mch	UTI	Urine	Streptococcus	Nit,Ak,G	Cip.Nx,Cot,Amx, Cfs
62	Anishma	7yrs/Fch	UTI	Urine	No growth		
63	Surya	5yrs/Mch	UTI	Urine	Klebsiella sp	Ak,G,Cip,Nx,Cfx,Ctx	Nit,Cot,Amx
64	Farhan	1yr/Mch	UTI	Urine	No growth		
65	Rithanya	6yrs/Fch	UTI	Urine	No growth		
66	Dharanesh	3yrs/Mch	UTI	Urine	No growth		
67	Aftar	5yrs/Mch	Bronchopneumonia	Blood	Proteus	Ak,Ctx,Cfs,Of	Cip,Nx,Cot,G
68	krishika	5months/Fch	Bronchopneumonia	Blood	No growth		
69	Noor Fathima	5yrs/Fch	UTI	Urine	No growth		
70	Ragavan	2yrs/Mch	Bronchopnemonia	Blood	No growth		
71	Manjula devi	2mths/fch	Bronchopneumonia	Blood	No growth		
72	Kamalesh	2yrs/Mch	UTI	Urine	No growth		
73	Vikram	7yrs/Mch	UTI	Urine	No growth		
74	Anish	8yrs/Mch	UTI	Urine	No growth		
75	Sabari	6yrs/Mch	UTI	Urine	No growth		
76	Harismitha	8months/Fch	UTI	Urine	E. Coli	Nit,Ak,Cfs	Cot,Nx,Cip,G,Ctx
77	Snehavardhini	2yrs/Fch	UTI	Urine	Staph. Aureus	Ak,G,Ctx,Nx	Cot,Nit,CN,Cip
78	Vedanth	3yrs/Mch	urinary tract infection	Urine	E.Coli	Nit,Nx,Cip,G,Ak,Cfs	Cot,CN
79	Hemanth	1 1/2 yrs/Mch	axillary abscess	Pus	Staph aureus	Ctx,Ak	G,Cip,CN,Cot,Amx

80	Ammu	4months/Fch	Bronchopneumonia/ sepsis	Blood	No growth		
81	Alhith	1y 10 m/M	UTI	Urine	No growth		
82	Harshini	9 1/2 yrs/F	UTI	Urine	No growth		
83	Sajitha	5yrs /Fch	UTI	Urine	Pseudomonas	Cip,Ami,Nx,Nit	Cot
84	Varshika	2yrs/Fch	Acute CNS infection	Blood/CSF	no growth		
85	Abinaya	12yrs/Fch	UTI	Urine	No growth		
86	Avanthika	10 months/Fch	UTI	Urine	No growth		
87	Sai Surya	2yrs	Nephrotic Syndrome with SBP	Blood	No growth		
88	Karthikeyan	10yrs/Mch	Nephrotic syndrome with SBP	Blood	No growth		
89	Nethra	1yrs/Fch	Bronchopneumonia	Blood	No growth		
90	Md Shahid	10yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
91	Praveen	2yrs/Mch	UTI	Urine	No growth		
92	Evanjelin	2yrs/Fch	UTI	Urine	No growth		
93	Haridharshini	2yrs/Fch	UTI	Urine	E.Coli	Ak,G,Cip,Nx,Ctx,Cfs	Cot,Amx
94	Vishnu	1yr/Mch	UTI	Urine	Klebsiella spp	Ak,G,Cip,Nx,,Nit,Cfs	Cot,Amx
95	Sivanesh	6yrs/Mch	UTI	Urine	No growth		
96	Gopalakrishnan	2yrs/Mch	Cellulitis	Pus	Staph aureus	Ak,D,Cfs,Ctx	CN,Amx
97	Gomathi	8yrs /Fch	Acute CNS infection	Blood/CSF	No growth		
98	Srihari	1yr/Mch	Bronchopneumonia	Blood	No growth		
99	B/o Meenakumari	2 1/2 months	Bronchopneumonia	Blood	No growth		
100	Sabitha	12yrs/Fch	Acute CNS infection	Blood/CSF	No growth		
101	Harshini	56days/Fch	ADD with septic shock	Blood	No growth		
102	Jeyandran	4 1/2yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
103	Aparnashree	7yrs/Fch	UTI	Urine	No growth		
104	Mohammad Anes	7yrs/Mch	UTI	Urine	No growth		
105	cholan	10yrs/mch	UTI	Urine	No growth		
106	Harish	10yrs/Mch	UTI	Urine	No growth		

107	Durgesh	3 months/Mch	Acute CNS infection	Blood/CSF	no growth		
108	Sulaiman	1yr 7 months/M	UTI	Urine	No growth		
109	Sri	7mths/Mch	Bronchopneumonia	Blood	No growth		
110	Fathima	8yrs/Fch	UTI	Urine	No growth		
111	Sushmitha	10yrs/Fch	UTI	Urine	No growth		
112	Sadana	2yrs / Fch	abscess Lt postauricular region	Blood/Pus	No growth		
113	Meelu	10yrs/Fch	UTI	Urine	No growth		
114	Blessy	9yrs /Fch	Acute CNS infection	Blood/CSF	No growth		
115	Mahalakshmi	6yrs/Fch	UTI	Urine	Klebsiella	Ak,Cfs,Ctx	Cip,Amx,Nx,G
116	Rakesh	8mths/Mch	ADD/septic cardiogenic shock	Blood	No growth		
117	Shruthi	2yrs/F	Bronchopneumonia	Blood	No growth		
118	NilOfer	10yrs/Fch	Nephrotic syndrome/SBP	Blood Ascitic fluid	No growth Klebsiella	Ak,Ctx,Cfs,CN,G,Ctz	Amx,Nx
119	Samson	7yrs/Mch	Nephrotic syndrome	Blood	No growth		
120	Raja Md	11yrs/Mch	UTI	Blood	No growth		
121	Sivaprakash	5yrs/mch	UTI	Urine	E.coli	Cip,Nx,Nit,G,Ak,Ctx,Cfs	Cot,Amx
122	Md Tameez	34days/mch	Acute CNS infection	Blood/CSF	No growth		
123	david akash	8yrs/mch	Acute CNS infection	Blood/CSF	No growth		
124	Ashika	9yrs/fch	Acute CNS infection	Blood/CSF	No growth		
125	Rekha	4yrs/fch	Pneumonia	Blood	Coag -ve staph	Cip,Of,Ctx,G,Ak,Cfs	Amx,CN
126	Siva	4yrs/mch	UTI	Urine	Kebsiella	Cip,Ak,Cfs,Ctx	Cot,Amx,Cn,G
127	Vijayalakshmi	5yrs/fch	UTI	Urine	Klebsiella	Ak,Cfs,Ctx	Cot,Amx,Nit,Nx,Cip
128	Jasmine	6yrs/fch	UTI	Urine	Klebsiella	Nx,Cip,G,Ak,Ctx,Ctz	Amx,Nit,Cot
129	Ivanjelin	2yrs/Fch	Brain abscess	Pus	No growth		
130	Ethuvan	45days/MCH	Acute CNS infection	Blood/CSF	No growth		
131	Thoufiya	10yrs/Fch	UTI	Urine	No growth		
132	Chitheswar	3months/Mch	Bronchopneumonia	Blood	Staph. Aureus	Ak,G,,Ctz,CN	Amx,Cip,E,Do,Cot
133	Thanishram	4mths/Mch	Bronchopneumonia	Blood	No growth		

134	Jeeva	4 yr/Mch	Bronchopneumonia	Blood	No growth		
135	Aiman Faiz	2yrs/Fch	Bronchopneumonia	Blood	No growth		
136	Satheesh	2yrs/Mch	UTI	Urine	No growth		
137	Karishma	7yrs/Fch	Nephrotic syndrome with SBP	Blood Ascitic fluid	No growth Klebsiella spp	Ak,Ctx,Cip,Cot	Amx,G,Cip,Nx
138	Varshini	3months/Fch	UTI	Urine	No growth		
139	Alagunatchiyar	8 1/2 mths/Fch	Bronchopneumonia	Blood	No growth		
140	Mithin	2yrs/Mch	Bronchopneumonia	Blood	No growth		
141	Vinushree	4yrs /Fch	UTI	Urine	No growth		
142	Vanishree	6yrs/Fch	UTI	Urine	No growth		
143	Kamalnath	10yrs/Mch	UTI	Urine	No growth		
144	Akilesh	6 yrs/Mch	UTI	Urine	No growth		
145	Vishnupriya	12yrs/Mch	ADD with septic shock	Stool	No growth		
146	gokulakrishnan	4yrs/Mch	Empyema	Blood	No growth		
147	Aseela	7yrs/Fch	Acute CNS infection	Blood/CSF	no growth		
148	Mahalakshmi	3yrs/Fch	UTI	Urine	No growth		
149	Sana Fathima	2yrs/ Fch	Nephrotic syndrome	Blood	No growth		
150	B/O Gowri Sankari	43days/Fch	Acute CNS infection	Blood/CSF	No growth		
151	Hana sulthana	6yrs/fch	UTI	Urine	No growth		
152	Aathil	2yrs/Fch	UTI	Urine	E.coli	Nt,Ak,Cfs,Cts,G	Cot,Amx,Cip,Nx
153	Keerthiga Sankari	7yrs/Fch	UTI	Urine	E.coli	Nit,Nx,Ak,Cfs,G,Ctx	Cip,Amx,Cot
154	Kidhiyan	7yrs/Fch	UTI	Urine	Klebsiela spp	G,Ak,Cfs	Cot,Nit,Amx,Nx,Cip,Ctx
155	Bharathi	9yrs/Fch	ADD with decompensated shock	Stool	No growth		
156	Divya	5yrs/Fch	UTI	Urine	No growth		
157	Arunesh Shankar	7yrs/Mch	UTI	Urine	E.coli	Cfs,Ctx,G,Ak	Nit,Nx,Cip,Cot,Amx
158	Mukesh	7yrs/Fch	Nephrotic syndrome with SBP	Blood	Klebsiella	Cot,Cip,G,Ak,Ctz	Amx
159	Diya	5yrs/Fch	UTI	Urine	No growth		
160	Janani	2yrs/Fch	UTI	Urine	Klebsiella spp	Cot,G,Ak,Ctx,Cfs	Nit,Amx,Cip,Nx

161	David	8yrs/mch	Acute CNS infection	Blood/CSF	no growth		
162	Bharani	5yrs/Fch	UTI	Urine	Klebsiella spp	Ak,Cfs	Cot,Amx,G,Ctx,Cip,Nx
163	Ragul	2yrs,Mch	Nephrotic syndrome with SBP	Blood	No growth		
164	Gnana Soundarya	9yrs/Fch	Acute CNS infection	Blood/CSF	no growth		
165	Kokila	4yrs/Fch	Acute CNS infection	Blood/CSF	No growth		
166	Jagadeeshan	6yrs/mch	UTI	Urine	Klebsiella spp	Ak,Ctz,Ctx	Nit,Cot,Nx,CipAmx,G
167	Siba sherin	9yrs/Fch	Pneumonia	Blood	no growth		
168	Yaswanth	9yrs/Mch	Pneumonia	Blood	No growth		
169	Thangamani	56 days	Bronchopneumonia	Blood	No growth		
170	B/o Mangammal	4mths/Mch	Bronchopneumonia	Blood	No growth		
171	Krithika kumari	2yrs/Fch	ADD with septic shock	Stool	No growth		
172	B/o Nithya	34days/Fch	Bronchopneumonia	Blood	No growth		
173	Vaishnavi	5yrs/Fch	Acute CNS infection	Blood/CSF	No growth		
174	Harshitha	3months/Fch	Acute diarrheal disease with septic shock	stool	No growth		
175	Gokula preethi	3yrs/Fch	UTI	Urine	No growth		
176	Abinav Mugund	3yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
177	Boopathi	6yrs/mch	UTI	Urine	No growth		
178	Hashvida	8months/Fch	Bronchopneumonia	Blood	No growth		
179	Monisha	6months/fch	ADD with septic shock	Stool	No growth		
180	Dharchana	4yrs /Mch	Acute CNS infection	Blood/CSF	No growth		
181	Jasmine	3yrs/Fch	Acute CNS infection	Blood/CSF	No growth		
182	Jebin	11months/Mch	Bronchopneumonia	Blood	No growth		
183	Nagendran	10yrs/mch	Nephrotic syndrome with SBP	Blood	No growth		
184	Sajith	11yrs/Mch	UTI	Urine	No growth		
185	Sanjana	3yrs/Fch	UTI	Urine	No growth		
186	Md Rasool	9yrs/Mch	UTI	Urine	No growth		
187	Vijay	8yrs/mch	Acute CNS infection	Blood/CSF	No growth		

188	Rejina	4 1/2 yrs/Fch	UTI	Urine	No growth		
189	Ashif	2 mnths/Mch	Bronchopneumonia	Blood	no growth		
190	shafik	3mnths/mch	Bronchopneumonia	Blood	no growth		
191	Deepa Darshini	5 yrs/fch	ADD with septic shock	Stool	No growth		
192	Maheesiya	1 1/2yrs/Fch	Bronchopneumonia	Blood	No growth		
193	vanitha	2yrs/Mch	Bronchopneumonia	Blood	No growth		
194	Dhayalan	4yrs/Mch	Bronchopneumonia	Blood	No growth		
195	Keerthiga	8yrs/Fch	UTI	Urine	E.coli	Ak,G,Ctx,Cfs	Cot,Amx,Cip,CN
196	DharunRaj	31/2 yrs?Mch	UTI	Urine	No growth		
197	Saroj	4yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
198	Dhaswin	3yrs/mch	Acute CNS infection	Blood/CSF	No growth		
199	Reshma	1yr/Fch	UTI	Urine	E.coli	Nit,Nx,Cip,G,Ak,Cfs	Cot,Amx
200	Sunitha	3yrs/Fch	Acute CNS infection	Blood/CSF	No growth		
201	Anjishaun	1yr/2months	Bronchopneumonia	Blood	No growth		
202	Sathya	3yrs/Fch	Bronchopneumonia	Blood	No growth		
203	Saishree	2yrs/Fch	Bronchopneumonia	Blood	No growth		
204	Bhavadharani	2yrs/Fch	UTI	Urine	E.coli	Nit.G,Ak,Cfs	Cot,Amx,Cip,Ctz
205	B/o Sangeetha	42 days/Fch	Acute CNS infection	Blood/CSF	No growth		
206	Ramya devi	11yrs/Fch	Pneumonia	Blood	No growth		
207	Tejeswini	7mths/Fch	Bronchopneumonia	Blood	No growth		
208	Monica	48days/Fch	UTI	Urine	E.Coli	Ak,Cfs,Nit	G,Cip,Nx,Amx,cot
209	Sanju	7yrs/Mch	Bronchopneumonia	Blood	No growth		
210	Prajith	5yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
211	Vikramathithran	10yrs/Mch	UTI	Urine	Proteus sp.	Cfs,Ctx	Ak,G,Cip,Nx,Nit,Amx,Cot
212	Vijay	7yrs/Mch	UTI	Urine	No growth		
213	Vishalini	7yrs/Fch	Pneumonia	Blood	No growth		
214	Sabari	7yrs/Mch	Acute CNS infection	Blood/CSF	No growth		

215	Gopika	&yrs /Fch	UTI	Urine	No growth		
216	Navanitha krishnan	9yrs/Mch	UTI	Urine	Proteus sp	G,Ak,Nx,Nit,Ctx,Cfs	Amx,Cip,Cot
217	Malarvizhi	7yrs/Fch	UTI	Urine	no growth		
218	Ajimal	7yrs/Mch	UTI	Urine	E.coli	Cip,Nx,Nit,G,Ak,Cfs	Cot,Amx
219	Dharnish	2yrs/Mch	UTI	Urine	E.coli	Cip,Nx,Nit,G,Ak,Cfs	Cot,Amx
220	Kanchana	5yrs/Fch	UTI	Urine	E.coli	Ak.Cfs	G,Cip,Nx,Nit,Amx,Cot
221	Santhosh	9yrs/Mch	UTI	Urine	E.Coli	Ak,G,Cip,Nx,Cfs	Nit,Cot,Amx
222	Saravan	12yrs/Mch	UTI	Urine	E.coli	Ak,G,Cfs	Cip,Nx,Amx,Cot,Nit
223	Rathish	3yrs/Mch	UTI	Urine	Proteus sp	Ak,Cfs,	G,Cip,Nx,Amx,Cot,Nit
224	Banu	8 months /Fch	UTI	Urine	No growth		
225	Gokul	4 months/Mch	Bronchopneumonia	Blood	No growth		
226	Jothi	5yrs/Fch	Acute CNS infection	Blood/CSF	No growth		
227	Krijesh	3yrs/Mch	UTI	Urine	No growth		
228	Gowtham	6yrs/Mch	UTI	Urine	No growth		
229	Kavya	6yrs/Fch	pneumonia	Blood	Staph aureus	Cip,CN,G.Ak,Ctx,Cfs	Cot ,Amx
230	Unnikrishnan	11yrs/Mch	UTI	Urine	No growth		
231	Pranesh	10mths/Mch	Bronchopneumonia	Blood	No growth		
232	Lakshana	6mths/Fch	Bronchopneumonia	Blood	no growth		
233	Abhi	5yrs/Fch	Acute CNS infection	Blood/CSF	Nogrowth		
234	Ameena	2yrs/Fch	Parapharyngeal abscess	Pus	Staph aureus		
235	Ganga	11yrs/Fch	Acute CNS infection	Blood/CSF	No growth		
236	Ragul	3mths/Mch	Bronchopneumonia	Blood	No growth		
237	Dhanushree	5yrs/Fch	acute cns infection	Blood/CSF	No growth		
238	Farya Sahrisha	50days/Fch	Bronchopneumonia	Blood	No growth		
239	Sathya	3mths/Fch	Bronchopneumonia	Blood	No growth		
240	Vishnu	6mths/Mch	Bronchopneumonia	Blood	No growth		
241	B/o Subapriya	2mths/Mch	Bronchopneumonia	Blood	No growth		

242	Rakshitha	1yr 9mths	Bronchopneumonia	Blood	No growth		
243	Sajina	2yrs/Fch	Acute CNS infection	Blood CSF	No growth		
244	B/O Aruna	4mths/Mch	Bronchopneumonia	Blood	No growth		
245	B/o Baby	38 days/Mch	Bronchopneumonia	Blood	No growth		
246	Mantra	7mths/Fch	Bronchopneumonia	Blood	No growth		
247	Sairam	4mths/Mch	Bronchopneumonia	Blood	No growth		
248	Sajithkumar	10mths/Mch	Acute CNS infection	Blood CSF	No growth		
249	Babulal	11yrs/Mch	cellulitis left LL	Pus	No growth		
250	Sadiq sara	1 1/4 yrs/Fch	Bronchopneumonia	Blood	No growth		
251	Deepika	11mths/Fch	Acute CNS infection	Blood/CSF	No growth		
252	B/O Pavithra	42 days/Fch	Bronchopneumonia	Blood	No growth		
253	Aswath	3yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
254	Hari Rakshit	13 mths/Mch	bronchopneumonia	Blood	No growth		
255	Dharnesh kumar	6yrs/Mch	UTI	Urine	No growth		
256	Sumitha	1yr/Fch	Bronchopneumonia	Blood	No growth		
257	Srinithi	3mths/Fch	PNEUMONIA	Blood	No growth		
258	Antony	5yrs/Mch	CNS infection	Blood/CSF	No growth		
259	Madhumitha	5yrs/Fch	Bronchopneumonia	Blood	No growth		
260	Vasanth	5yrs/Mch	Bronchopneumonia	Blood	No growth		
261	Ashifa	8Yrs/Fch	UTI	Urine	No growth		
262	Raja	11yrs/Mch	UTI	Urine	E. coli	Ak,Nit,Cfs	Cot,Amx,Cip,Nx,G,Ctx
263	Mahalakshmi	7yrs/Fch	UTI	Urine	No growth		
264	Balaguru	6yrs/Mch	Pneumonia	Blood	Coag-ve staph.	E,G,AK	Cot,Amx,Cip,CN,Ctx,
265	Harish	3yrs/Mch	UTI	Urine	Pseudomonas	G,Ak,Cfs	Amx,Cip,Nx,Nit,Ctx
266	Abirami	2yrs/Fch	Pneumonia	Blood	Klebsiella species	Cip,CN,G,Ak,Ctx,Cfs	Cot,Amx
267	Rifa Fathima	6yrs/Fch	UTI	Urine	Klebsiella sp	Amx,Cip,Nx,G,Ak,Ctx,Cfs	Cot
268	Bharani	7yrs/Mch	UTI	Urine	Klebsiella sp	Cfs,Ak	Cot,Amx,G,Ctz,Cip,Nx,Nt

269	Sivaranjani	7yrs/Fch	UTI	Urine	E.Coli	Nit,G,Ak,Cfs	Cot,Amx,Cip,Nx,Ctx
270	Gurunath	10/M	ADD with septic shock	Stool	No growth		
271	Angelin	2 1/2/Fch	Bronchopneumonia	Blood	No growth		
272	Avanthika	1/f	Bronchopneumonia-	Blood	No growth		
273	Abishek	3/M	Pneumonia	Blood	No growth		
274	Tharanitharan	8/M	Pneumonia	Blood	No growth		
275	Harish	2m/M	AGE with septic shock	stool	no growth		
276	Purushothaman	8/M	Acute CNS infection	Blood/CSF	No growth		
277	Sivaranjani	1/F	AGE with septic shock	stool	no growth		
278	Charuhasini	6/f	Bronchopneumonia	Blood	No growth		
279	Sakthy Rupa	1 1/2 /f	Pneumonia	Blood	No growth		
280	Gokul kannan	10mths/M	Pneumonia	Blood	No growth		
281	Yadhavan	6y/M	Nephrotic syndrome with SBP	Blood Ascitic fluid	No growth		
282	Abraham	1 1/2mon/Mch	Pneumonia	Blood	No growth		
283	Abinaya	8yr/f	Brain abscess	Pus	S.aureus	Ak,Cfs,Do,Ctx,Ctz,E,G	Cip,Cn,Cot,Amx
284	Kabilash	2y/M	AGE with septic shock	stool	No growth		
285	Rohit	9y/M	AGE with septic shock	stool	No growth		
286	Sadhana	9mon/F	Bronchopneumonia	Blood	No growth		
287	swetha	3 1/2/f	UTI	Urine	No growth		
S.No.	Name	Age/Sex	Diagnosis	specimen	Blood	Sensitivity	Resistance
288	Shanmathi	6y/f	UTI	Urine	No growth		
289	Sai prasanth	7y/m	UTI	Urine	No growth		
290	B/o Sowmya	1mon/F	Bronchopneumonia	Blood	No growth		
291	Vanshika	2y/f	Pneumonia	Blood	No growth		
292	Arshath Ahmed	5y/m	Pneumonia	Blood	Coag -ve staph	G,Ak,Ctx,CN	E,cip,Amx,Cot
293	Kanisha	10mths/f	Bronchopneumonia	Blood	Coag -ve staph	Nit,Ak,Cfs	Cot,Cip,Nx,cot,Ctx,Amx
294	Selvakumar	8mth/m	Bronchopneumonia	Blood	No growth		

295	Madhan kumar	4/m	Acute CNS infection	Blood/CSF	No growth		
296	Karishma	9mths/f	Acute CNS infection	Blood/CSF	No growth		
297	Kamalesh	6yrs/m	UTI	Urine	No growth		
298	Ashiya	9mths/f	Bronchopneumonia	Blood	No growth		
299	Preethi	9yrs/f	UTI	Urine	Klebsiella sp	Cip,Nx,Nit,G,Ak,Ctx,Cfs	Amx,Cot
300	Surya	6mths/M	pneumonia	Blood	no growth		
301	Sagar	2y/m	Acute CNS infection	Blood/CSF	No growth		
302	Sridhar	1 1/2/M	Acute CNS infection	Blood/CSF	No growth		
303	Nathiya	10yrs/F	Pneumonia	Blood	No growth		
304	Guruprasad	10y/m	Pneumonia	Blood	No growth		
305	Dhakshetha	1 1/2 /f	Bronchopneumonia	Blood	No growth		
306	Devishree	2yrs/f	AGE with septic shock	stool	No growth		
307	sasiram	6mths/mch	bronchopneumonia	Blood	No growth		
308	Hariharan	7yrs/mch	Acute CNS infection	Blood/CSF	No growth		
309	Nitin	2yrs/Mch	Pneumonia	Blood	No growth		
310	Surendran	8yrs/mch	UTI	Urine	No growth		
311	Joe	10yrs/mch	Acute CNS infection	Blood/CSF	No growth		
312	Ayisha	1y/fch	Acute CNS infection	Blood/CSF	No growth		
313	Logesh	3y/mch	Acute CNS infection	Blood/CSF	No growth		
314	Jaswanth	3mths/Mch	Bronchopneumonia	Blood	No growth		
315	saisaran	3yrs/mch	Pneumonia	Blood	Klebsiella sp	Cip,G,Ak,Ctx	CN,Amx,Cot
316	Santhosh	2yrs/mch	Bronchopneumonia	Blood	Staph.Aureus	Cip,Cn,E,G,Ak,Ctx	Cot,Amx
317	Sanjanasri	1y/fch	Bronchopneumonia	Blood	Klebsiella sp	Cip,G,Ak,Cfs	Cot,CN,Amx
318	Md Ishaan	11mths/Mch	Bronchopneumonia	Blood	Klebsiella sp	Cip,G,Ak,Ctx,Cfs,Cot	Amx,CN
319	Gowtham	7yrs/mch	pneumonia	Blood	Coag -ve staph	Ak,Ctx,Cfs,G	Cip,CN,Amx
320	Nitish kumar	11yrs/mch	UTI	Urine	Klebsiella	Cfs	Cot,Amx,Cip,Nit,G,Ak
321	Harish	10yrs/Mch	UTI	Urine	E.coli	Ak,Cfs	Cot,Amx,Cip,Nx,Nit,G

322	Abhi	3yrs/fch	UTI	Urine	E.coli	Cip,Nx, Nit,G,Ak,Ctx,Cfs	Cot,Amx,
323	Manikandan	7yrs/Mch	UTI	Urine	E.coli	Cip,Nx,Nit,Ak,Ctx,Cfs	Cot,Amx,G
324	Tirupathi	10yr/Mch	Acute CNS infection	Blood/CSF	no growth		
325	Shathikshana	1 y/fch	Bronchopneumonia	Blood	no growth		
326	Prakash raj	12/mch	Nephrotic syndrome	Blood	No growth		
327	B/o Sudha	3mths/mch	Bronchopneumonia	Blood	no growth		
328	Anushka	4y/Fch	Bronchopneumonia	Blood	No growth		
329	Pariksha	4y/f	Empyema	Pus	no growth Staph aureus	Ak,Cfs,Ctx,G	CN,Cot,Amx
330	Sebastin	5y/mch	UTI	Urine	No growth		
331	sathyarooba	1 1/2y/f	UTI	Urine	E.coli	Cip,Nx,Nit,Ctx	Cot,Amx,G,Ak
332	sadhana	2/fch	Bronchopneumonia	Blood	no growth		
333	Subashri	1 3/4 /fch	UTI	Urine	No growth		
334	Madhesh	4y/mch	Acute CNS infection	Blood/CSF	no growth		
335	B/o Sudha	3mths/fch	Bronchopneumonia	Blood	coag-ve staph	Ak,Ctx	CN,Cot,Amx
336	Lakshmi	3mths/fch	Acute CNS infection	Blood/CSF	no growth		
337	Gokularaj	1y/mch	ADD I sepsis	blood	no growth		
338	Dinesh kumar	8y/mch	Acute CNS infection	Blood/CSF	no growth		
339	Navaneetha krishnan	10y/fch	pneumonia	Blood	no growth		
340	santhosh	3y/fch	Bronchopneumonia	Blood	No growth		
341	Aakash	9y/mch	Bronchopneumonia	Blood	no growth		
342	Mukilan	7mths/Mch	UTI	Urine	No growth		
343	Janani	11y/fch	Cellulitis right LL	Pus	no growth		
344	Rebriya	3mths/fch	ADD with septic shock	blood	no growth		
345	Lingeswaran	6mths/mch	Bronchopneumonia	Blood	no growth		
346	Rithanya	6yrs/fch	Nephrotic syndrome with SBP	blood	Klebsiella	Cip,G,Ak	CN
347	Litheen	10mths/mch	Bronchopneumonia	Blood	No growth		
348	Prethisha	6y/fch	Bronchopneumonia	Blood	no growth		

349	Vaideeshwaran	8y/mch	Acute CNS infection	Blood/CSF	no growth		
350	Navitha	8y/fch	Acute CNS infection	Blood/CSF	no growth		
351	Thiyophylus	7y/mch	pneumonia	Blood	klebsiella	G,Ak,Ctx	Cot,Cip,CN,Amx
352	Dharun	6y/mch	UTI	Urine	No growth		
353	Arunadevi	12/Fch	Pneumonia	Blood	no growth		
354	Rakesh	1y/mch	Acute CNS infection	Blood/CSF	no growth		
355	Sudeep	5mths/mch	Bronchopneumonia	Blood	no growth		
356	Vimala	12yrs/Fch	Acute CNS infection	Blood/CSF	no growth		
357	Navdeep	5 1/2 Mch	Multiple abscess with cellulitis	pus	staph. aureus	Ctx,Ak,G,Cfs	Cot,Amx,Cip
358	Monicka	3yrs/Fch	Bronchopneumonia	Blood	no growth		
359	Sheik Mohammad	8yrs/Mch	UTI	Urine	No growth		
360	B/o Rahmath Beevi	45days Mch	UTI	Urine	No growth		
361	Madhulika	3moths/Fch	Bronchopneumonia	Blood	No growth		
362	Anitha	8mths/fch	Bronchopneumonia	Blood	No growth		
363	Aswanth Mithran	2yrs/mch	Bronchopneumonia	Blood	No growth		
364	Navaneethan	9yrs/Mch	Pneumonia	Blood	No growth		
365	Abu Bakar	11yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
366	Monika	3yrs/Fch	Bronchopneumonia	Blood	No growth		
367	Reena	12yrs/Fch	Acute CNS infection	Blood/CSF	no growth		
368	Jasmika	4yrs/Fch	Bronchopneumonia	Blood	no growth		
369	Amsa Begam	12y/Fch	Acute CNS infection	Blood/CSF	no growth		
370	Yatheesh	2yrs/Mch	Bronchopneumonia	Blood	No growth		
371	Janani	9yrs/Fch	Acute CNS infection	Blood/CSF	No growth		
372	Abinaya	6yrs/Fch	Acute CNS infection	Blood/CSF	No growth		
373	Chandru	9yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
S.No.	Name	Age/Sex	Diagnosis	specimen	Blood	Sensitivity	Resistance
374	Madhan	9yrs/mch	UTI	Urine	Pseudomonas	Cip,Nx,G,Ak,Ctx	Nit,Amx

375	Vaseekaran	11yrs/Mch	UTI	Urine	No growth		
376	Srinivasan	2yrs/Mch	UTI	Urine	Klebsiella	Nit,Nx,G,Ak	Cot,AMX,Cip,Ctx
377	Ilan	2yrs/Mch	UTI	Urine	Klebsiella	Cip,Nx,G,Ak,Ctx	Nit,Cot,Amx
378	Prathaban	9mths/Mch	Bronchopneumonia	Blood	No growth		
379	John Plason	7yrs/Mch	Pneumonia	Blood	No growth		
380	Farhat	3yrs/Fch	UTI	Urine	No growth		
381	Justin	7mths/Mch	Bronchopneumonia	Blood	No growth		
382	Kaliammal	7mths/Fch	Pneumonia	Blood	No growth		
383	Saranya	6yrs/Fch	Bronchopneumonia	Blood	No growth		
384	Anbarasu	8yrs/Mch	Nephrotic syndrome with SBP	blood	No growth		
385	Md Anil	4yrs/Mch	Bronchopneumonia	Blood	No growth		
386	Sahaya Raj	4mths/Mch	Bronchopneumonia	Blood	No growth		
387	Kishore	4mths/Mch	Bronchopneumonia	Blood	No growth		
388	B/o Indumathi	72 days/Fch	Bronchopneumonia	Blood	No growth		
389	Lakshitha	5yrs/Fch	Acute CNS infection	Blood/CSF	No growth		
390	Pavidarshini	10mths/Fch	Acute CNS infection	Blood/CSF	No growth		
391	Ailal Krishna	3yrs/Mch	UTI	Urine	E.coli	Cip,Amp,Nit,Nx	Amx,Cot
392	Janani	4yrs/Fch	UTI	Urine	No growth		
393	Sri Aswath Hari	7mths/Mch	ADD	stool	No growth		
394	Diya shree	7yrs/Fch	UTI	Urine	Klebsiella sp	Cip,Nx,Nit,G,Ak,Ctx,	Cot,Amx
395	Adhila	6yrs/Fch	Pneumonia	Blood	No growth		
396	Shanmathi	8yrs/Fch	cellulitis	Pus	No growth		
397	Gowtham	10yrs/Mch	Pneumonia	Blood	No growth		
398	Ragavan	9yrs/Mch	UTI	Urine	No growth		
399	Parivendhan	4yrs/Mch	Cellulitis	Pus	No growth		
400	George Michael	7yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
401	Yasmin	5 1/2 yrs/ Fch	Acute CNS infection	Blood/CSF	No growth		

402	Krishnan	4yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
403	Ezhilarasan	2yrs/Mch	Bronchopneumonia	Blood	No growth		
404	Ansuman	1yr/Mch	Acute CNS infection	Blood/CSF	No growth		
405	Kamalesh	9yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
406	Lithika Sri	11mths/Fch	Acute CNS infection	Blood/CSF	No growth		
407	Deepika	8yrs/Fch	Bronchopneumonia	Blood	No growth		
408	Akshitha	2yrs/Fch	Bronchopneumonia	Blood	No growth		
409	Prathima	5yrs/Fch	UTI	Urine	Klebsiella spp	Ak,G,Nx	Cip,Ctx,Nit,Amx,Cot
410	Sapal Sarkar	10yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
411	Praketha	1 1/2 Mch	Acute CNS infection	Blood/CSF	No growth		
412	Tanisha	4yrs/Fch	Empyema	Blood,Pus	No growth		
413	Apsal	8yrs/Mch	Acute CNS infection	Blood/CSF	No growth		
414	Sanjana	10mths/Fch	Bronchopneumonia	Blood	No growth		
415	Saharudeen	10mths/Mch	Bronchopneumonia	Blood	No growth		
416	Prathan	3 1/2yrs/Mch	Bronchopneumonia	Blood	No growth		
417	B/o Rajathi	37days/Mch	Pneumonia	Blood	No growth		
418	Md Ali	5yrs/Mch	UTI	Urine	Klebsiella spp	Cip,,Ak,Nx,Ctx	Cot,Amx
419	Kaviyaram	1yr/Mch	Bronchopneumonia	Blood	No growth		
420	Kanishka	3yrs/Fch	BronchoPneumonia	Blood	No growth		
421	Malathi	7yrs/Fch	Pneumonia	Blood	No growth		
422	guhan	2yrs/Mch	Bronchopneumonia	Blood	No growth		
423	Selavakumar	10mths/Mch	Acute CNS infection	Blood/CSF	No growth		
424	Parameshwaran	4mths/Fch	Bronchopneumonia	Blood	No growth		