"CLINICAL PROFILE OF FEVER IN THE GERIATRIC PATIENTS ADMITTED IN ICU-A ONE YEAR HOSPITAL BASED CROSS SECTIONAL STUDY"

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LIST OF ABBREVIATIONS USED

Sl. No.	Abbreviation used	Full Form
1	°C	Celsius
2	°F	Fahrenheit
3	A.M	Ante Meridiem
4	AKI	Acute Kidney Injury
5	ALD	Alcoholic Liver Disease
6	cAMP	Cyclic Adenosine Monophosphate
7	CAP	Community Acquired Pneumonia
8	CMV	Cytomegalovirus
9	CNF	Cytotoxic Necrotizing Factor
10	CNS	Central Nervous System
11	COPD	Chronic Obstructive Pulmonary Disease
12	CRP	C-Reactive Protein
13	CSF	Cerebrospinal Fluid
14	CT	Computed Tomography
15	CURB65	Confusion, Urea, Respiratory rate, Blood pressure, Age>65years
16	DM	Diabetes Mellitus
17	DVT	Deep Venous Thrombosis

18	E.coli	Escherichia coli
19	EBV	Epstein-Barr Virus
20	ESR	Erythrocyte Sedimentation Rate
21	HIV	Human Immunodeficiency Virus
22	IBD	Inflammatory Bowel Disease
23	ICU	Intensive Care Unit
24	IGRA	Interferon Gamma Release Assay
25	IHD	Ischaemic Heart Disease
26	IL	Interleukin
27	LFT	Liver Function Test
28	LRTI	Lower Respiratory Tract Infection
29	MODS	Multiple Organ Dysfunction Syndrome
30	MRI	Magnetic Resonance Imaging
31	OVLT	Organum Vasculosum Laminae Terminalis
32	P.M	Post Meridiem
33	PCR	Polymerase Chain Reaction
34	PCT	Procalcitonin
35	PET	Positron Emission Tomography
36	PGE2	Prostaglandin E2
37	PSI	Pneumonia Severity Index

38	PUO	Pyrexia of Unknown Origin
39	PVD	Peripheral Vascular Disease
40	RA	Rheumatoid Arthritis
41	RCC	Renal Cell Carcinoma
42	SGOT	Serum Glutamic Oxaloacetic Transaminase
43	SGPT	Serum Glutamic Pyruvic Transaminase
44	SLE	Systemic Lupus Erythematosus
45	SPECT	Single Photon Emission Computed Tomography
46	TLC	Total Leukocyte Count
47	TNF	Tumor Necrosis Factor
48	USG	Ultrasonography
49	UTI	Urinary Tract Infection
50	VAP	Ventilator Acquired Pneumonia
51	WBC	White Blood Cell

ABSTRACT

Background:

Geriatric population is the population whose age falls above 60 years. It forms 11.5% of the total 7 billion population in the world. Fever in geriatric population predisposes to higher morbidity, mortality. Atypical and typical, both patterns of fever are seen in geriatric patients. Sepsis is an vital factor which leads to increased morbidity, mortality in geriatric patients. Studies regarding fever in geriatric patients admitted in ICU are less. Managing the geriatric patients is challenging. Severe sepsis is more frequent in geriatric population and associated with increased morbidity, mortality. Timely management is required for better outcomes in these patients. Therefore, further studies on the geriatric patients will help to decide appropriate management in future.

Objectives:

1. To study the clinical profile of fever in the geriatric patients admitted in ICU.
2. To study the etiologies of fever in the geriatric patients admitted in ICU.

Methodology:

This study was a one year hospital based cross sectional study which comprised of 100 patients. The study included geriatric patients who presented with fever and admitted in ICU or those who developed fever after admission. A detailed history was taken and local, systemic examination was carried out. The relevant investigations were done and the data was collected using a proforma meeting the objectives of the study. The clinical profile of fever in the geriatric patients admitted in ICU was studied.

Results:

The study included a total of 100 geriatric patients admitted in ICU with fever or later developing fever.

Out of the total 100 patients, 62(62%) were males and 38(38%) were females.

The mean age was 70.27 years. 53(53%) patients were in 60-69 years group, 31(31%) were seen in 70-79 years group and 16(16%) were above or equal to 80 years.

In the duration of stay, a total number of 46(46%) patients were in the 1-5 days group, 32(32%) were in the 6-10 days group, 14(14%) were in the 11-15 days group and 8(8%) were in the 16 days or more group. The mean duration of stay was 7.30 days.

All patients had fever. Dyspnoea was the commonest symptom after fever and was seen in 27(27%) patients. This was followed by cough, seen in 18(18%) patients. The commonest cause of fever was pneumonia(36%), followed by UTI(26%), cellulitis(7%), viral fever(5%) and others. Only 6(6%) patients developed fever after admission. The causes included Pneumonia(4%) and Bedsores(2%).

Tachycardia was seen in 82(82%) patients. Hypotension was seen in 30(30%) patients, Tachypnoea in 36% patients.

Out of 100 patients, 31(31%) patients died and 69(69%) patients were discharged.

The most common cause of mortality was pneumonia (17%). UTI was the next common cause seen in 7(7%) patients.

The commonest co-morbidity was Diabetes mellitus(51%). Next was hypertension (35%), IHD (6%), hypothyroidism(4%), Alcoholic(1%), PVD(1%).

The most common complication was sepsis seen in 40(40%) patients. This was followed by AKI (36%), shock (30%), ventilatory support (18%).

Anaemia was seen in 52% patients. TLC were raised in 78% patients. Thrombocytopenia was detected in 41% patients. ESR, CRP were raised in 57% and 52% patients respectively. In renal tests, urea was raised in 63% patients and creatinine was increased in 73% patients. In LFTs, total bilirubin was raised in 25% patients. SGOT, SGPT were raised in 57% and 32% patients respectively. Hypoalbuminemia was seen in 67% patients. Serum procalcitonin was raised in 77% patients.

Out of 36(36%) patients with pneumonia, bacterial pneumonia was seen in 27(75%) and viral pneumonia was seen in 9(25%) patients.

Urine was normal in 75(75%) patients. 25(25%) patients showed increased WBCs in urine.

No blood culture growth was seen in 80% patients. Among the blood culture positive patients(20%), the commonest organism was E.coli which was isolated in 8(8%) patients. Next was Klebsiella which was isolated in 3(3%) patients.

79(79%) patients showed normal findings in the USG. Among the abnormal USG(21%), the commonest abnormality seen was cystitis in 11(11%) patients.

There was no growth in 69% patients. Among the urine culture positive patients(21%), the commonest organism was staphylococcus which was seen in 20(20%) patients. This was followed by E.coli(6%), Enterococcus(2%), Klebsiella(2%), Acinetobacter(1%).

In pus culture, Staphylococcus was the most frequent organism which was present in 3(3%) patients and in sputum culture, Enterococcus was seen in 3(3%).

Interpretation and Conclusion:

Based on the findings of this study, the most cause of fever in the geriatric patients admitted in ICU was pneumonia followed by UTI. Other causes should also be considered in geriatric patients. Mortality was seen in 31% patients. The mean duration of stay was 7.30 days. The commonest etiology of death was pneumonia. The most common co-morbidities seen were Diabetes mellitus followed by hypertension. The complications seen were sepsis, AKI, shock. In pneumonia, bacterial cause was more common than viral. Sepsis was seen in 40% patients and serum procalcitonin was raised in 77%. Serum procalcitonin is an early marker of sepsis. Blood culture showed Staphylococcus as the commonest organism isolated. Urine culture showed E.coli.

Keywords: Geriatric, Fever, Sepsis, Pneumonia, UTI

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INTRODUCTION

Geriatric population is the population whose age falls above 60 years. It forms 11.5 % of the total 7 billion population of the world.[12]

Fever in geriatric population predisposes to higher morbidity, mortality. It is seen that, the increasing age in such patients is related to infectious susceptibility. The important factors which increase the infections in these patients include reduced immune function, environmental factors and low reserves[13].

High morbidity, mortality is seen in geriatric population due to lower physiological reserves, low immune response which can be explained due to biological changes seen with aging and also the co-morbidities in geriatric patients[14].

Atypical and typical, both patterns of fever are seen in geriatric patients. Fever in geriatric patients is mostly due to a serious infection which can be viral, bacterial in comparison to the younger group. The response is also different in geriatrics as compared to the young[15].

Infectious diseases lead to increase in morbidity, mortality in this geriatric population. Infectious diseases can cause fever in almost 75 percent of geriatric population. They usually come with atypical symptoms. UTI, LRTI and dermal infections remain important etiologies of infectious disease[19,20,21].

The inflammatory diseases which cause fever in the geriatric patients include Temporal Arteritis, RA, SLE, Polymyalgia Rheumatica, IBD, granulomatous hepatitits, deQuervain's thyroiditis. Temporal Arteritis, Polymyalgia Rheumatica have been seen in 60 percent of cases. They are common in the female patients[40,41].

Sepsis is an vital factor which leads to increased morbidity, mortality in geriatric patients. The sepsis as per studies is more in geriatric patients than the young. Around 50% to 60% mortality rates seen in geriatric patients is associated with sepsis. Sepsis stimulates the coagulation pathway which is important for the occurrence of sepsis. Malnutrition is common in geriatric population and increases the morbidity.

The comorbid conditions are very important since they increase the outcome of the geriatric patients with sepsis admitted in the ICU. Among the comorbid conditions, diabetes is common followed by cardiovascular conditions including hypertension. Gram-negative organisms are frequent which can be multidrug resistant. This is due to recurrent hospitalization and interventions like urinary catheterizations, multiple drug use.[43,44,45,46]

The blood cultures in the geriatric patients admitted with ICU showed more of gram-positive cases as compared to gram-negative. The important features include early resuscitation and antibiotic coverage. Vasopressors like dopamine or norepinephrine can be used to increase perfusion in hypotensive patients despite appropriate fluid challenges.

The geriatric patients sometimes need mechanical ventilation in certain scenarios. This may be linked with increased mortality. Glycemic control, DVT prophylaxis are also important components in managing sepsis.[47,48,49,50,51,52]

Studies regarding fever in geriatric patients admitted in ICU are less. But to plan for future healthcare policies, further studies must focus on geriatric patients. Managing the geriatric patients is challenging. Severe sepsis is more frequent in

geriatric age groups and associated with increased morbidity, mortality. Timely management is required for better outcomes in these patients.Therefore, more clinical trials and studies on the geriatric patients will help to decide appropriate management in future.

OBJECTIVES

1. To study the clinical profile of fever in the geriatric patients admitted in ICU

2. To study the etiologies of fever in the geriatric patients admitted in ICU.

REVIEW OF LITERATURE

HISTORY OF FEVER:

Fever is an important symptom known to us since early times and it has been associated with old civilizations including Indian, Egyptian and Greek. People were apprehensive of fever and related it to punishment by demons and that it would cause death. Therefore, many methods were applied to treat this fever. Hippocrates in his literature explained the benefits of fever in the body during some illness. This was also shown by Rufus in 2nd century. Celsius proposed that fever and inflammation were related[1].

Thermometer is the tool used in present day clinical practice and helps us to detect raised temperature. In earlier days, back of the hand was used to give a rough idea of raised temperature. In 1592, Galileo invented a device but without any scales to measure temperature. Later, scales were added by Huygens in 1665. In 1724, Daniel Fahrenheit established that mercury was better than water due to rapid expansion[2].

FEVER:

Definition:

Fever has been defined as the anti meridiem temperature of more than 37.2°C (98.9°F) or the post meridiem temperature of more than 37.7°C(99.9°F). Normally, the temperature in a healthy individual in the age group of 18 years to 40 years is 36.8°C with variation 0.4°[3].

During the temperature measurement, the site of measurement is a factor that has to be kept in mind. The daily temperature variation normally is 0.5°C. The temperature measured in rectum is more than oral readings which can be attributed to oral breathing. Lower esophagus gives a good indication of the temperature inside the body and this reading is 0.8°C lesser than rectal measurement. Gender variations are commonly seen during temperature measurements[4].

BODY TEMPERATURE REGULATION:

Fever is a complicated interrelated response which is achieved with the help of central nervous, autonomic system with the inputs from endocrine system. The temperature is mainly regulated by a hypothalamic centre. The important purpose of this centre(thermoregulatory) is to combine the stimuli received from both cold, hot receptors in our body and then to generate the output that either conserves or increases its dissipation[5].

Thermoregulation is maintained by hypothalamus. This is essential to maintain our body temperature. Usually, three processes are involved, which includes the afferent stimulus, the central control and the efferent response. The afferent stimulus is generated with the help of hot and cold receptors present in body which detect the temperature variations. This stimulus reaches the hypothalamus via the peripheral nerves. Hypothalamus has two centers, the preoptic(anterior) part and the posterior part. The signals that reach hypothalamus are consolidated by this center to maintain normal temperature. The heat arising from the metabolic processes occuring in muscle, liver and that which is dissipated from skin are balanced. The efferent process is the body's behavioral changes which occur due to temperature changes[6].

PATHOGENESIS OF FEVER:

PYROGENS:

The term 'pyrogen' means fire(pyro) in Greek. Pyrogens are those microbial products that produce fever when released in the blood. They may be either exogenous or endogenous. Exogenous type can be microbial toxins, product, or the whole organism. They are produced outside the body. These act by stimulating production of cytokines or by acting on OVLT (anterior part of hypothalamus). This stimulation of OVLT produces cytokines which in turn leads to fever. Structurally they contain lipopolysaccharide which may be pyrogenic[7].

The endogenous pyrogens are nothing but cytokines that lead to fever. They are also termed as pyrogenic cytokines. These include IL-1,6 and TNF, CNF. IL-1 was the earliest cytokine discovered. Fever may be due various causes such as fungal, bacterial and also inflammatory. All these diseases release the above described cytokines that can stimulate hypothalamus and cause fever. Also, during the process of fever, prostaglandins are released. The important prostaglandin is PGE2. PGE2 is produced from the endothelium of hypothalamus and acts on the receptor and leads to cAMP release. cAMP is important since it can change the set point of fever in the hypothalamus[8].

FEVER PATTERNS[9]:

Continuous fever:

In this type, temperature remains elevated above normal without touching the baseline and the fluctuation does not exceed 0.6°C (1°F) in 24 hours.

Examples:

1. Pneumonia
2. Brucellosis
3. Enteric fever
4. UTI

Intermittent fever:

The elevated temperature touches the normal in between. Septic fever is a form of intermittent fever. Quotidian fever is a hectic fever occuring daily. Diurnal variation seen is large in septic type of intermittent fever.

Remittent fever:

The temperature fluctuation exceeds 0.6°C (1°F) , but without touching the normal.

Relapsing fever:

These are recurrent fevers with afebrile periods in between for > 1 day. In tertian fever, the documented fever is on the 1st and 3rd day. This is seen in malaria by vivax, ovale, falciparum. In quartan fever , the fever is documented on 1st and 4th day. This is seen in malariae.

The various fever etiologies are described below[10]:

INFECTIOUS CAUSES

Specific locations:

Abscesses: hepatobiliary, urinary tract, pulmonary, CNS

Infections of oral cavity, head and neck

Infective endocarditis

Specific organisms:

Tuberculosis

HIV

Viral: CMV, EBV, Dengue

Fungal

Malignancy:

Haematological malignancy

Lymphoma

Leukaemia

Myeloma

Solid tumors

Abdominal infections

Connective tissue etiologies:

Temporal arteritis

Juvenile rheumatoid arthritis

SLE

Vasculitic disorders

Polymyositis

Behcet's disease

Rheumatic fever

Miscellaneous:

Cardiovascular

Atrial myxoma

Aortitis

Aortic dissection

Respiratory

Sarcoidosis

Pulmonary embolism

Gastrointestinal

IBD

ALD

Pancreatitis

Cholecystitis

Endocrine

Thyrotoxicosis

Thyroiditis

Phaeochromocytoma

Drug reactions

Antibiotic fever

INVESTIGATIONS:

MICROBIOLOGICAL INVESTIGATIONS IN FEVER

Microscopic investigation

Blood for Malaria, Borrelia, Trypanosomiasis, EBV, CMV

Respiratory samples for mycobacteria, fungi

Stool for ova, parasites

Biopsy for light microscopy (mycobacteria, fungi)

Urine

Culture

Blood

CSF

Stool

Aspirates and biopsies

Swabs

Urine

Antigen detection

Blood

CSF for cryptococcal antigen

Nucleic acid detection

Blood for Bartonella and viruses

Cerebrospinal fluid for viruses and key bacteria

Nasopharyngeal aspirate/throat swab for respiratory viruses

Tissue specimens

Urine for Chlamydia, Neisseria

Stool for norovirus, rotavirus

Immunological tests

Serology for viruses, dimorphic fungi and bacteria

IGRA for tuberculosis

ADDITIONAL INVESTIGATIONS:

Serology for connective tissue etiologies

Autoantibody screen

Complement levels

Immunoglobulins

Cryoglobulins

Echocardiography

Ultrasound of abdomen

CT/MRI of thorax, abdomen and brain

Imaging of the skeletal system

Plain X-rays

CT/MRI spine

Isotope bone scan

Labelled white cell scan

PET/ SPECT

Biopsy

Bronchoscopy and lavage

Lymph node aspirate or biopsy

Biopsy of radiological lesion

Biopsy of liver

Bone marrow aspirate and biopsy

Lumbar puncture

Laparoscopy and biopsy

Temporal artery biopsy

GERIATRIC POPULATION:

Geriatric population is the population whose age falls above 60 years. It forms 11.5 % of the total 7 billion population of the world. This population will increase up to 22 % in the next 30 years. The statistics of geriatric populations calculated is different in each country varying across continents. Kerala(12.3%) is the state with highest geriatric population and it is least in Assam(6.5%)[11,12].

FEVER IN GERIARIC PATIENTS:

Fever in geriatric population predisposes to higher morbidity, mortality. It is seen that, the increasing age in these patients is directly related to infectious susceptibility. The important factors which increase the infections in these patients include reduced immune function, environmental factors and low reserves[13].

High morbidity, mortality is seen in geriatric population due to lower physiological reserves, low immune response which can be explained due to biological changes seen with aging and also the co-morbidities in geriatric patients. In geriatric population, more hospitalization is seen which leads to more nosocomial infections[14].

Atypical and typical, both patterns of fever can be seen in geriatric patients. The atypical presentation has been explained as reduced response to an infection or blunted. This leads to poor diagnosis of the underlying cause of fever. Fever in geriatric patients is mostly due to a serious infection which can be viral, bacterial in comparison to the younger group. The response is also different in both the groups. Viral etiologies are less in geriatric population as compared to the younger group but bacterial diseases are more common[15].

As the age progresses, many changes are seen in the immunological system of our body. Changes can be seen in the functions of the blood cells including T cells, B cells , phagocytes. Transendothelial migration defect is seen with aging. Cytokine production and cell migration are affected by aging in the geriatric population. The increased infections is attributed to these changes. Phagocytic activity is usually normal. Humoral immunity also seems to be unchanged. Cell mediated immunity declines with aging. The declining function of immune system seen with aging is one of the factors, but very few studies confirm this hypothesis[16,17].

The host factors are also associated with environmental exposure which contribute to the increased susceptibility. There are certain malignant conditions which increases as the age progresses and increase the infections. The main cancers involve the pancreas, lung, prostate. Multiple myeloma, chronic lymphoblastic leukemia are also seen. The host factors include the mechanical barriers such as the skin and mucous membrane. These patients have skin changes like thinning of skin, reduced glandular secretions. Bedsores, injuries are also common in this population which lead to more infections[18].

INFECTIOUS ETIOLOGIES:

Infectious diseases lead to increase in morbidity, mortality in this geriatric population. Infectious diseases can cause fever in almost 75 percent of geriatric population. They usually come with atypical symptoms. UTI, LRTI and dermal infections remain important etiologies of infectious disease[19,20,21].

PNEUMONIA:

Almost 90 % of deaths in pneumonia are seen in geriatric population. Sepsis is also associated with UTI in this population. Tuberculosis and HIV have poor prognosis in these patients. They usually come with atypical symptoms[22].

Pneumonia remains the 2nd common cause for hospitalization in geriatric patients. The geriatric patients are prone to pneumonia and there has been increased mortality. These patients usually require longer hospitalization and develop complications. Pneumonia in geriatric patients progress very rapidly. The mortality is almost 20 percent. Many factors have been attributed with the poor prognosis of pneumonia in geriatric patients[23,24,25].

The structural abnormality in the airways and alveoli resulted in 83 % of deaths in pneumonia. 48 % of mortality was due to respiratory insufficiency[26].

Old age, alcohol intake, respiratory diseases like asthma, HIV status are important risk factors causing pneumonia in geriatric patients. The important changes are low compliance of lung, reduced strength in the respiratory musculature and reduced recoiling ability. These changes increase the incidence of pneumonia. The most frequent organism is Streptococcus pneumoniae seen in 19-58 % of cases. Other organisms included Haemophilus , Moraxella catarrhalis , Staphylococcus which were seen in 5-14 %, 4 % and 7 % respectively. Gram-negative bacilli were seen only in 3 % of patients with pneumonia. Atypical organisms were also less. Among the atypical organisms, Chlamydophila pneumoniae is common followed by Mycoplasma pneumoniae. The current H1N1 influenza pandemic should be kept in mind in this population. The available investigations and screening tests are poor[27,28,29,30,31].

The PSI score, CURB65 help in assessing severity when a patient presents to the hospital with suspected pneumonia. It mainly differentiates between patients that could be treated in an OPD basis versus the inpatient observation[32].

UTI IN GERIATRIC PATIENTS:

UTI is frequently seen in geriatric patients. Differentiating symptomatic UTI from asymptomatic remains a challenge. Women are more affected when compared to men in geriatric patients. Reduced function of immune system predisposes for increased infections. Catheter insertion frequently leads to UTI. Bladder disorders in CNS conditions like stroke increases UTI. Clinical features includes fever associated with chills, urgency, frequency, burning micturition, abdominal pain. E.coli is the usual organism isolated from culture followed by Enterobacter, Staphylococcus [33,34,35,36,37,38].

SKIN INFECTIONS:

Skin, soft tissue infections are frequently seen in geriatric patients. Infected ulcer and cellulitis are also common. Prompt diagnosis and immediate therapy including appropriate antibiotics, dressings on regular basis are needed based on clinical features and the extent of the infection. Staphylococcus, Streptococcus remain the common organisms leading to these infections[39].

The other causes in the infectious group of fever in geriatric patients include meningoencephalitis, viral infections, malaria, fungal infections. Infections like Brucellosis, Dengue fever, Leptospirosis, Scrub typhus, can also lead to fever in the geriatric population.

NON INFECTIOUS CAUSES OF FEVER:

INFLAMMATORY DISEASES:

The inflammatory diseases which cause fever in the geriatric patients include Temporal Arteritis, RA, SLE, Polymyalgia Rheumatica, IBD, granulomatous hepatitits, deQuervain's thyroiditis. Temporal Arteritis, Polymyalgia Rheumatica have been seen in 60% of cases. They are common in the female patients[40,41].

TUMORS:

Malignancies can cause fever in geriatric patients. It accounts for 25 % of PUO. Lymphoma is the frequent cause. The cytokines released from the cancer cells is the main factor which causes fever. Chemotherapy drugs and DVT are also contributing factors. The common neoplastic causes of geriatric fever are lymphoma(57%), atrial myxoma, hepatoma, RCC and colon cancer(17%)[42].

SEPSIS IN GERIATRIC PATIENTS :

Sepsis is an vital factor which leading to increased morbidity, mortality in geriatric patients. The sepsis as per studies is more in geriatric patients than the young. Around 50% to 60% mortality rates is seen in geriatric patients associated with sepsis. This increased risk in the geriatric patients is due to co-morbidities like cancer, diabetes mellitus, obesity, and HIV. Sepsis stimulates the coagulation pathway which is important for the occurrence of sepsis. Malnutrition is common in geriatric population and increases the morbidity. Malnutrition can be due to inactivity, social isolation, functional limitations, chronic disease, alcohol intake. The comorbid conditions are very important since they increase the outcome of the geriatric patients with sepsis admitted in the ICU. Among the co-morbidities, diabetes is common

followed by cardiovascular conditions including hypertension. Gram-negative organisms are frequent which can be multidrug resistant. This is due to recurrent hospitalization and interventions like urinary catheterizations, multiple drug use.[43,44,45,46]

The blood cultures in the geriatric patients admitted with ICU showed more of gram-positive cases as compared to gram-negative. Staphylococcus was most common seen in 42.60% of patients. This was followed by E.coli seen in 31.30 % of cases. The sepsis management follows the Sepsis bundle guidelines. The important features include early resuscitation and antibiotic coverage. Vasopressors like dopamine or norepinephrine can be used to increase perfusion in hypotensive patients despite appropriate fluid challenges. The geriatric patients sometimes need mechanical ventilation in certain scenarios. This may be linked with increased mortality. Glycemic control, DVT prophylaxis are also important components in managing sepsis.[47,48,49,50,51,52]

AREAS OF FURTHUR INVESTIGATIONS:

Studies regarding fever in geriatric patients admitted in ICU are less. But to plan for future healthcare policies, further studies must focus on geriatric patients. Managing the geriatric patients is challenging. Severe sepsis is more frequent in geriatric age groups and associated with increased morbidity, mortality. Timely management is required for better outcomes in these patients. Therefore, more clinical trials and studies on the geriatric patients will help to decide appropriate management in future.

METHODOLOGY

Study design:

A cross-sectional study with consecutive samples was adopted for this study.

Study source:

This study was conducted in the patients admitted in ICU in the Department of Medicine, KLE's Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi as a part of the MD academic curriculum.

Study duration:

The study was conducted between 1st January 2018 to 31st December 2018.

Ethical clearance:

It was granted by the JNMC Institutional Ethics Committee on Human Subjects Research, J.N.Medical College, Belagavi **(Ref: MDC/DOME/40 dated 22/11/2017).**

Sample size:

The study was a non randomized single-arm observational study with consecutive samples. The sample included only the geriatric patients admitted in ICU with fever or later developing fever. Hence, based on previous records of geriatric patients admitted in ICU with fever or later developing fever, a sample size of 100 was selected.

As this is a cross- sectional study,

Sample size formula:

The minimum sample size formula based on prevalence is

$$n = \frac{z_\alpha{}^2 P(1-P)}{d^2}$$

where P is the percentage of prevalence and d is the percentage likely difference in the prevalence.

z_α is linked with the level of significance. For 5% level of the significance $z_\alpha = 1.96$.

With P=50% and d=20% the sample size is 100.

Inclusion criteria:

1. Geriatric patients presenting with fever and admitted in ICU.
2. Geriatric patients who did not have fever at the time of presentation, but later developed a baseline temperature elevated ≥1.3°C after ICU admission.

[Geriatric patient: patient with age >60 years

Fever: an A.M temperature of >37.2°C(>98.9°F) or a P.M temperature of >37.7°C(>99.9°F) would define fever]

Exclusion criteria:

1. Patients who did not give consent.

Data collection:

All the patients fulfilling the inclusion criteria and willing to participate were included in the study. Informed consent were taken. A detailed history regarding the age, gender, occupation, duration of complaints, fever, co-morbid conditions was taken. Local and systemic examination was carried out. The relevant investigations were done and the data was collected using a proforma meeting the objectives of the study.

Statistical Method for Data Analysis:

The data collected was coded and entered into Microsoft Excel Worksheet. For the continuous quantitative variables mean and standard deviation were calculated. Percentages were used to determine the categorical data. Suitable graphs and tables were used to depict the data.

RESULTS

The study included a total of 100 geriatric patients admitted in ICU with fever or later developing fever.

Demographic profile:

Table 1 and **Chart 1** depicts the demographic profile of geriatric patients admitted in the ICU with fever.

Out of the total 100 patients, 62 were males and 38 were females.

Geriatric population is defined as the population ≥ 60 years. The mean age was 70.27 years. They were again divided in the sub-groups of 60-69 years, 70-79 years and those above or equal to 80 years. 53% patients were in 60-69 years group, 31% were seen in 70-79 years group and 16% were above or equal to 80 years.

Chart 1: Demographic profile of the geriatric patients in the ICU with fever.

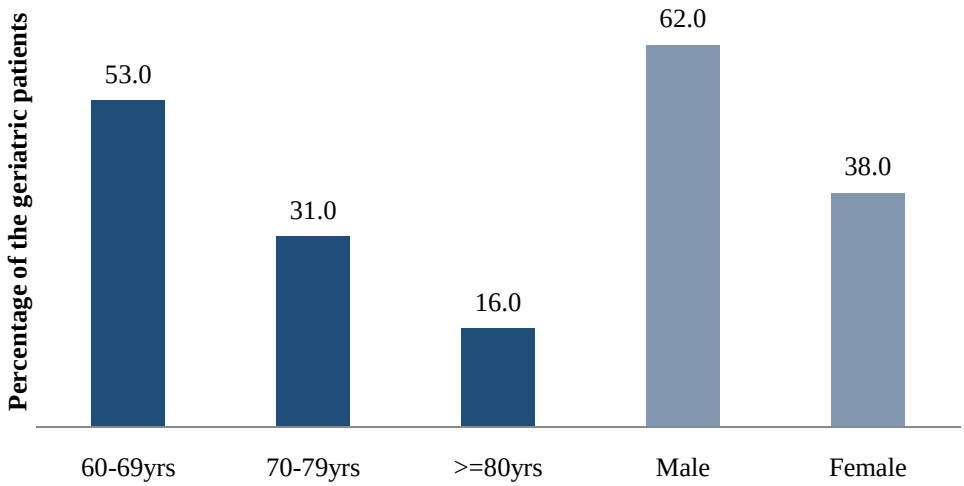


Table 1: Demographic profile of the geriatric patients in ICU with fever.

Demographic profile	No of patients	% of patients
Age groups		
60-69 yrs	53	53.00
70-79 yrs	31	31.00
≥80 yrs	16	16.00
Mean	70.27	
SD	8.53	
Gender		
Male	62	62.00
Female	38	38.00

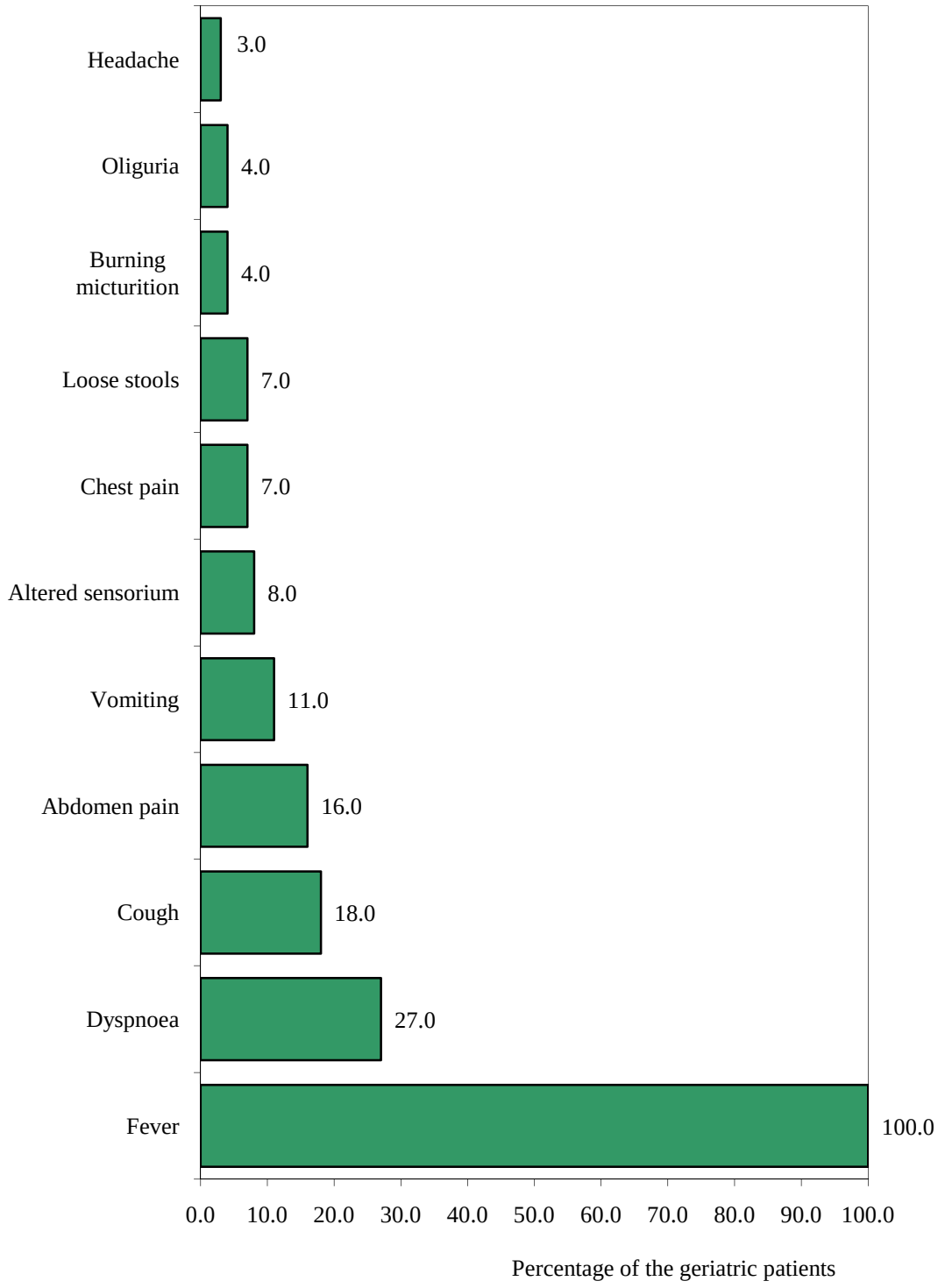
Clinical symptoms:

The clinical symptoms in geriatric patients admitted in ICU with fever are shown in **Table 2** and **Chart 2**. Out of the total 100, 94(94%) patients came with fever and 6(6%) patients developed fever after admission. Dyspnoea was the commonest symptom after fever and was seen in 27(27%) patients. This was followed by cough seen in 18(18%) patients. The other important symptoms were abdominal pain(16%), vomiting(11%), altered sensorium(8%), chest pain(7%), loose stools(7%), burning micturition(4%), oliguria(4%) and headache(3%).

Table 2: Clinical symptoms in the geriatric patients admitted in ICU with fever.

Sl.No.	Clinical symptoms	No of patients	% of patients
1	Fever	100	100.00
2	Dyspnoea	27	27.00
3	Cough	18	18.00
4	Abdomen pain	16	16.00
5	Vomiting	11	11.00
6	Altered sensorium	8	8.00
7	Chest pain	7	7.00
8	Loose stools	7	7.00
9	Burning micturition	4	4.00
10	Oliguria	4	4.00
11	Headache	3	3.00

Chart 2: Clinical symptoms in the geriatric patients admitted in ICU with fever.



Clinical signs in the geriatric patients admitted in ICU with fever:

Table 3 depicts the clinical signs in the geriatric patients admitted in ICU with fever. Tachycardia was seen in 82(82%) patients. Hypotension was seen in 30(30%) patients, Tachypnoea in 36% patients. Respiratory findings were seen in 52(52%) patients. Abdominal findings were seen in 12% patients. Altered sensorium was found in 8% patients.

Table 3: Clinical signs in the geriatric patients admitted in ICU with fever.

Sl.No.	Clinical sign	No. of patients	% of patients
1	Tachycardia(HR>100 bpm)	82	82%
2	Hypotension(BP< 100/70)	30	30%
3	Tachypnoea	36	36%
4	Crepitations, Rhonchi	52	52%
5	Splenomegaly, Hepatomegaly	12	12%
6	Altered sensorium	8	8%

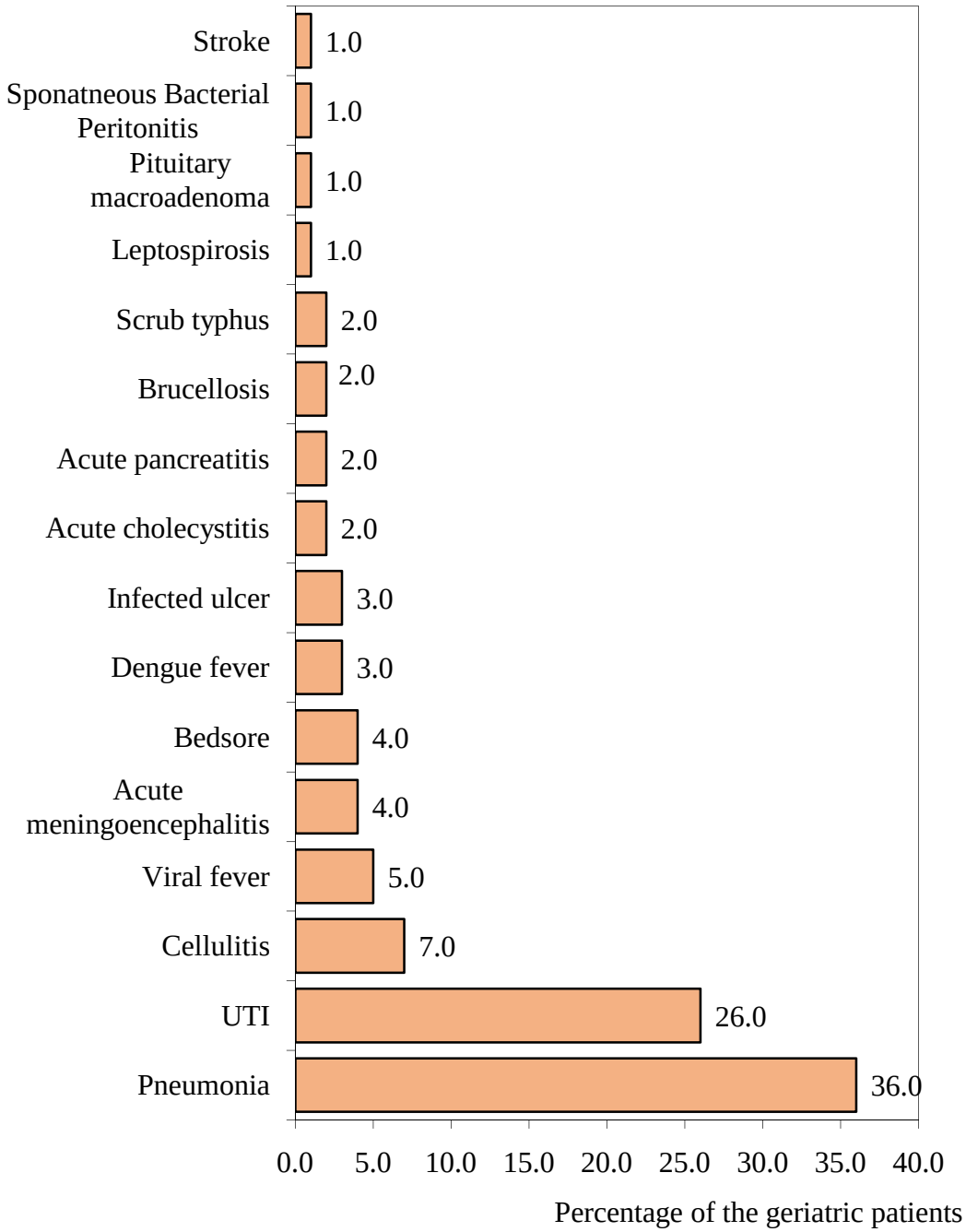
Etiology of fever in geriatric patients admitted in ICU:

Table 4 and **Chart 3** show the causes of fever in geriatric group in ICU. The commonest cause was pneumonia(36%), followed by UTI(26%), cellulitis(7%), viral fever(5%) and others.

Table 4: Etiology of fever in the geriatric patients admitted in ICU

Sl. No.	Diagnosis	No of patients	% of patients
1	Pneumonia	36	36.00
2	UTI	26	26.00
3	Cellulitis	7	7.00
4	Viral fever	5	5.00
5	Acute meningoencephalitis	4	4.00
6	Bedsore	4	4.00
7	Dengue fever	3	3.00
8	Infected ulcer	3	3.00
9	Acute cholecystitis	2	2.00
10	Acute pancreatitis	2	2.00
11	Brucellosis	2	2.00
12	Scrub typhus	2	2.00
13	Leptospirosis	1	1.00
14	Pituitary macroadenoma	1	1.00
15	Spontaneous Bacterial Peritonitis	1	1.00
16	Stroke	1	1.00

Chart 3: Etiology of fever in the geriatric patients admitted in ICU



Etiology of fever in the geriatric patients developed after admission in ICU:

Table 5 depicts the etiology of fever in geriatric patients developed after admission in ICU. Only 6(6%) patients developed fever after admission . The causes included Pneumonia(4%) and Bedsores(2%). All the 4 cases of pneumonia were VAP and due to bacterial etiology.

Table 5: Etiology of fever in the geriatric patients developed after admission in ICU

Sl. No.	Etiology of fever after admission	No of patients	% of patients
1	Pneumonia	4	4%
2	Bedsore	2	2%
	Total	6	6%

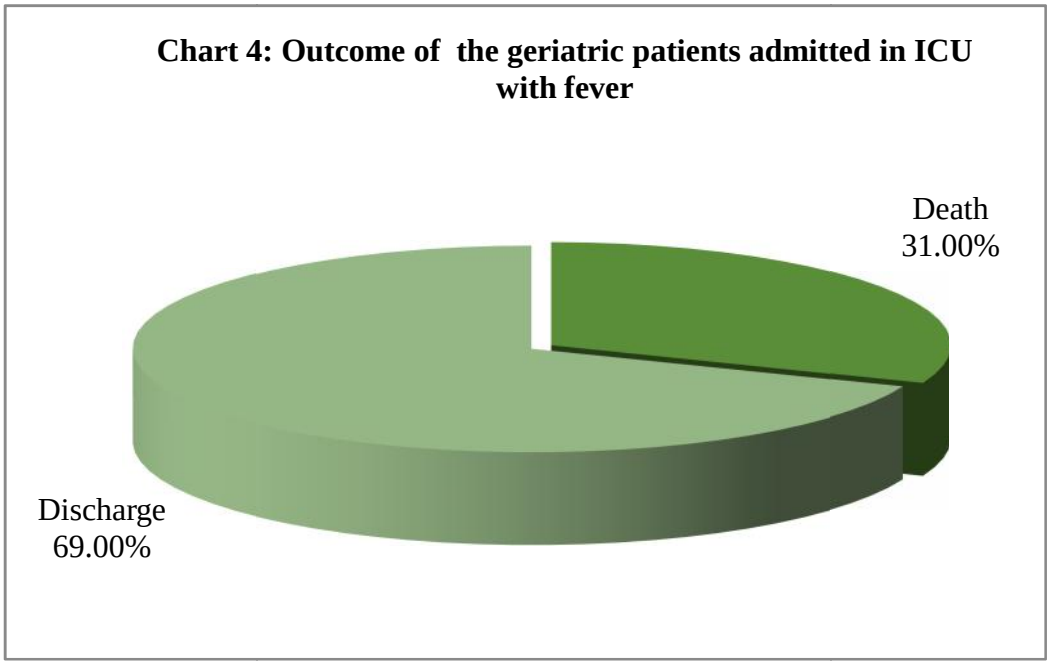
Outcome of the geriatric patients admitted in ICU with fever:

Table 6 and **Chart 4** show the outcome of geriatric patients admitted in ICU with fever. Out of 100 patients, 31(31%) patients died and 69(69%) patients were discharged.

Table 6: Outcome of the geriatric patients admitted in ICU with fever

Sl. No.	Outcome	No of patients	% of patients
1	Death	31	31.00
2	Discharge	69	69.00
	Total	100	100.00

Chart 4: Outcome of the geriatric patients admitted in ICU with fever



Duration of stay in the hospital:

The duration of stay in the hospital is shown in **Table 7**. The duration was shown in the number of days, 1-5 days, 6-10 days, 11-15 days and 16 days or above. A total number of 46% patients were in the 1-5 days group, 32% in the 6-10 days group, 14% in the 11-15 days group and 8% in the 16 days or above group. The mean duration of stay was 7.30 days.

Table 7: Duration of stay in the hospital

Sl.No.	Duration of stay in the hospital (no. of days)	No. of patients	% of patients
1	1-5 days	46	46.00
2	6-10 days	32	32.00
3	11-15 days	14	14.00
4	≥16 days	8	8.00
	Mean	7.30	
	SD	5.87	

Cause of death in the geriatric patients admitted in ICU with fever:

The cause of death in geriatric patients admitted in ICU with fever is shown in **Table 8**. The commonest cause was pneumonia(17%). UTI was the next commonest cause seen in 7(7%) patients. The other causes included Bedsore(2%), cellulitis(1%), Stroke(1%), Encephalitis(1%), Pancreatitis(1%), Pituitary macroadenoma(1%). In pneumonia, the mortality was 6% in viral etiology and 11% in bacterial pneumonia.

Table 8: Cause of death in the geriatric patients admitted in ICU with fever

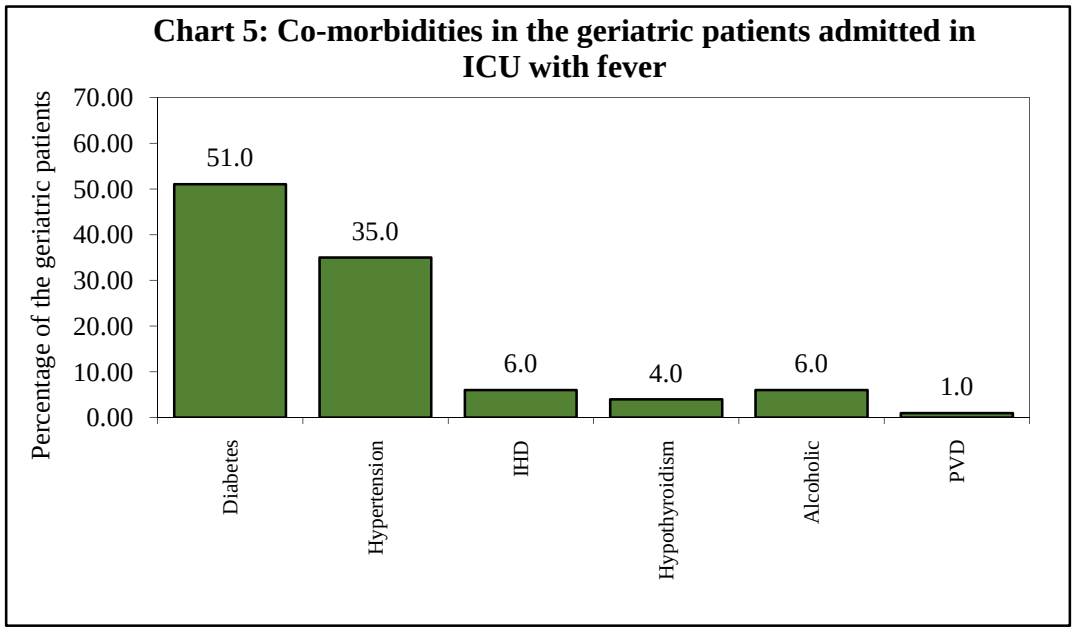
Sl. No.	Cause of death	No of patients	% of patients
1	Pneumonia	17	17%
2	UTI	7	7%
3	Bedsore	2	2%
4	Cellulitis	1	1%
5	Stroke	1	1%
6	Encephalitis	1	1%
7	Pancreatitis	1	1%
8	Pituitary macroadenoma	1	1%
	Total	31	31%

Co-morbidities in the geriatric patients:

Table 9 and **Chart 5** show the co-morbidities in geriatric patients. The commonest co-morbidity was Diabetes mellitus(51%). Next was hypertension(35%), IHD(6%), hypothyroidism(4%), Alcoholic(1%) and PVD(1%).

Table 9: Co-morbidities in the geriatric patients admitted in ICU with fever

Sl. No.	Co-morbidities	No of patients	% of patients
1	Diabetes mellitus	51	51.00
2	Hypertension	35	35.00
3	IHD	6	6.00
4	Hypothyroidism	4	4.00
5	Alcoholic	1	1.00
6	PVD	1	1.00



Laboratory parameters :

Table 10 and **Chart 6** shows the Laboratory parameters in the geriatric patients admitted in ICU with fever.

Anaemia was detected in 52% patients. TLC were raised in 78% patients. Thrombocytopenia was detected in 41% patients. ESR and CRP were raised in 57% and 52% patients respectively.

In renal tests, urea was raised in 63% patients and creatinine was increased in 73% patients.

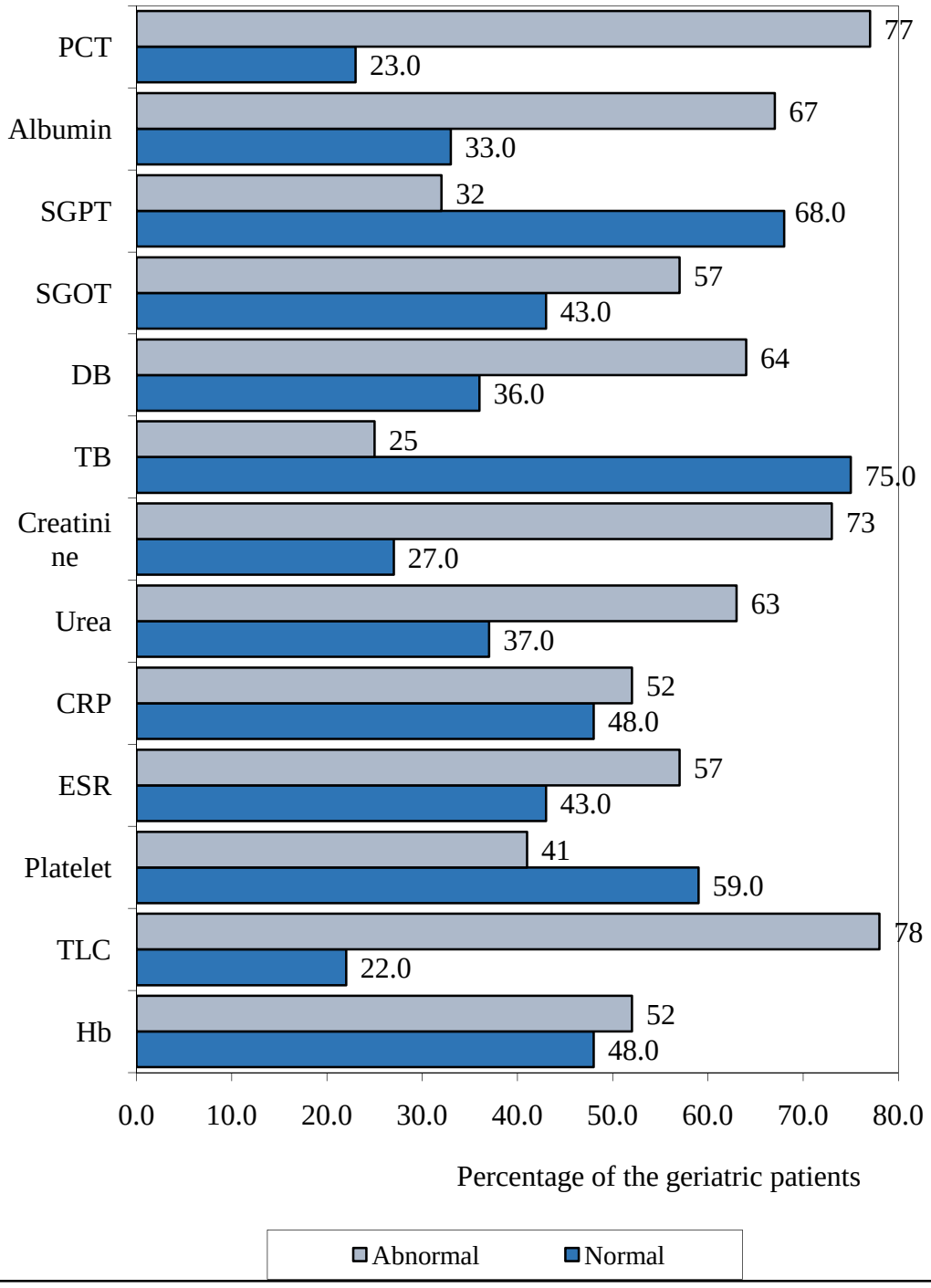
In Liver function tests, total bilirubin was raised in 25% patients. SGOT,SGPT were raised in 57% and 32% patients respectively. Hypoalbuminemia was seen in 67% patients.

Serum procalcitonin was raised in 77% patients.

Table 10: Laboratory parameters in the geriatric patients admitted in ICU with fever

Sl. No	Laboratory parameters	Normal	%	Abnormal	%
1	Haemoglobin	48	48.00	52	52.00
2	TLC	22	22.00	78	78.00
3	Platelet	59	59.00	41	41.00
4	ESR	43	43.00	57	57.00
5	CRP	48	48.00	52	52.00
6	Urea	37	37.00	63	63.00
7	Creatinine	27	27.00	73	73.00
8	TB	75	75.00	25	25.00
9	DB	36	36.00	64	64.00
10	SGOT	43	43.00	57	57.00
11	SGPT	68	68.00	32	32.00
12	Albumin	33	33.00	67	67.00
13	PCT	23	23.00	77	77.00

Chart 6: Laboratory parameters in the geriatric patients admitted in ICU with fever



Complications in the geriatric patients admitted in ICU with fever:

Table 11 shows the complications arising in the geriatric patients admitted in ICU with fever. The most common complication was sepsis seen in 40(40%) patients. This was followed by AKI(36%), shock(30%), ventilatory support(18%). Among these, mortality was seen in 18% with sepsis, 12% with AKI, 15% with shock and 10% with ventilatory support.

Table 11: Complications in the geriatric patients admitted in ICU with fever.

Sl.No.	Complications	No. of patients	% of patients	% of mortality
1	Sepsis	40	40%	18%
2	AKI	36	36%	12%
3	Shock	30	30%	15%
4	Ventilatory support	18	18%	10%

Pneumonia:

Out of 100 patients, pneumonia was diagnosed in 36 patients. **Chart 7** classified the etiology of pneumonia into viral and bacterial. Out of 36 patients, bacterial pneumonia was seen in 27(75%) and viral pneumonia was seen in 9(25%) patients. As shown in **Chart 8**, out of 36 patients, VAP was seen in 10(27.78%) and CAP was seen in 26(72.22%) patients.

Chart 7: Pneumonia in the geriatric patients in ICU with fever

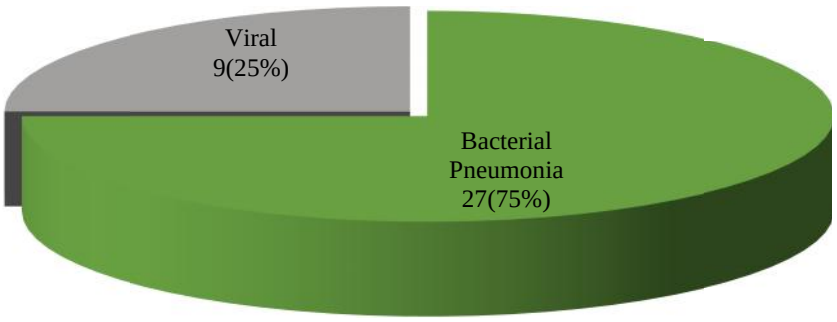


Chart 8: Etiology of pneumonia

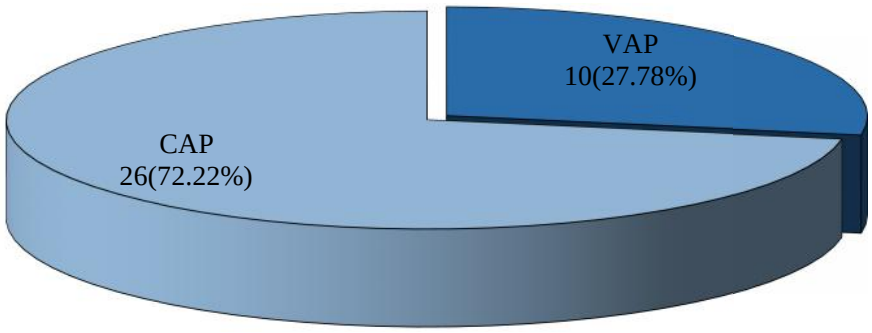


Table 12 depicts the risk factors seen in the patients with pneumonia. The most common risk factor was diabetes mellitus which was seen in 15(41.67%) patients out of the total 36 patients with pneumonia. This was followed by patients who were on ventilators which was seen in 10(27.78%) patients. The other risk factors included COPD, HIV, Chemotherapy drugs.

Table 12: Risk factors of pneumonia in the geriatric patients in ICU with fever.

Sl. No.	Risk factors of pneumonia	No of patients	% of patients
1	DM	15	41.67
2	Ventilators	10	27.78
3	COPD	8	22.22
4	HIV	4	11.11
5	Chemotherapy drugs	3	8.33
	Total	36	100.00

Table 13 shows the Chest X-ray findings in the geriatric patients admitted in ICU with fever. 63(63%) patients had no abnormality in the Chest X-ray. 36(36%) patients showed consolidation, 1(%) patient showed pleural effusion.

Table 13: Chest X-ray findings in the geriatric patients in ICU with fever.

Sl.No.	CXR findings	No of patients	% of patients
1	Normal	63	63.00
2	Consolidation	36	36.00
3	Pleural effusion	1	1.00
	Total	100	100.00

UTI:

UTI was seen in 26% patients. **Table 14** and **Chart 9** shows the urinary findings in geriatric patients in ICU with fever. It was normal in 75(75%) patients. 25(25%) patients showed increased WBCs in the urine.

Table 14: Urinary findings in the geriatric patients in ICU with fever.

Sl.No.	Urinary findings	No of patients	% of patients
1	Normal	75	75.00
2	Increased WBCs	25	25.00
	Total	100	100.00

Chart 9: Urinary findings in the geriatric patients in ICU with fever

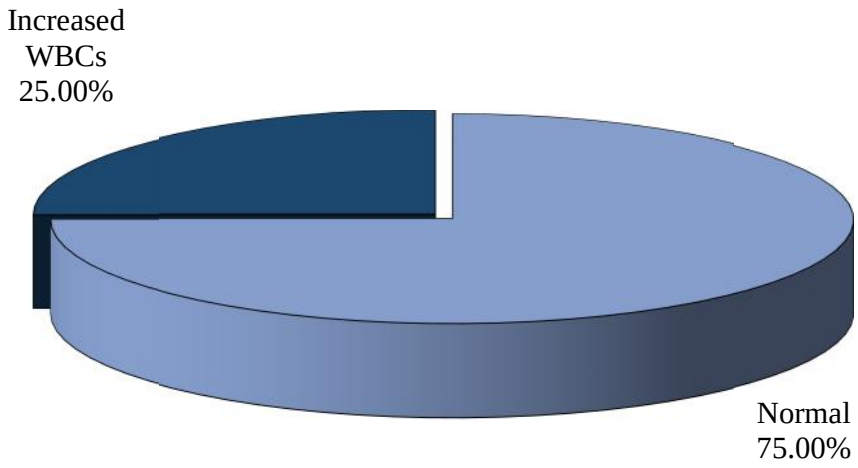


Table 15 shows the organisms isolated from urine culture in geriatric patients admitted in ICU with fever. No growth was seen in 80 patients. The commonest organism was E.coli which was isolated in 8(8%) patients. Next was Klebsiella which was isolated in 3(3%) patients. the other organisms included Candida(3%), Enterobacter(2%), Proteus(2%), Enterococcus(1%) and Kluyvera(1%).

Table 15: Urine culture in the geriatric patients admitted in ICU with fever.

Sl.No.	Urine culture	No of patients	% of patients
1	E.coli	8	8.00
2	Klebsiella	3	3.00
3	Candida	3	3.00
4	Enterobacter	2	2.00
5	Proteus	2	2.00
6	Enterococcus	1	1.00
7	Kluyvera	1	1.00
	Total urine culture positive	20	20.00
	No growth	80	80.00
	Total	100	100.00

Table 16 shows the USG findings in geriatric patients admitted in ICU with fever. 79(79%) patients showed normal findings in the USG. Among the abnormal USG(21%), the commonest abnormality seen was cystitis in 11(11%) patients. This was followed by pyelonephritis(7%), prostatis(2%), hydronephrosis(1%).

Table 16 : USG findings in the geriatric patients admitted in ICU with fever

Sl.No.	USG findings	No of patients	% of patients
1	Cystitis	11	11.00
2	Pyelonephritis	7	7.00
3	Prostatis	2	2.00
4	Hydronephrosis	1	1.00
	Total abnormal findings	21	21.00
	Normal	79	79.00

Blood culture:

Table 17 show the organisms isolated from blood cultures in geriatric patients in ICU with fever. There was no growth in 69 patients. Among the positive blood cultures(31%), the commonest organism was staphylococcus which was seen in 20(20%) patients. This was followed by E.coli(6%), Enterococcus(2%), Klebsiella(2%), Acinetobacter(1%).

Table 17: Organisms isolated from blood culture in the geriatric patients in ICU with fever

Sl.No.	Blood culture	No of patients	% of patients
1	Staphylococcus	20	20.00
2	E.coli	6	6.00
3	Enterococcus	2	2.00
4	Klebsiella	2	2.00
5	Acinetobacter	1	1.00
	Total blood culture positive	31	31.00
	No growth	69	69.00
	Total	100	100.00

Organisms isolated from other sources:

Table 18 shows the organisms isolated from other sources in geriatric patients admitted in ICU with fever. The other sources included pus and sputum. Pus culture was positive in 6(6%) patients and sputum culture was positive in 9(9%) patients. In pus culture, the commonest organism was Staphylococcus which was present in 3(3%) patients, followed by Enterococcus which was present in 2(2%) patients. In sputum culture, the commonest organism was Enterococcus which was seen in 3(3%), followed by Klebsiella seen in 2(2%) patients, Acinetobacter in 2(2%) patients.

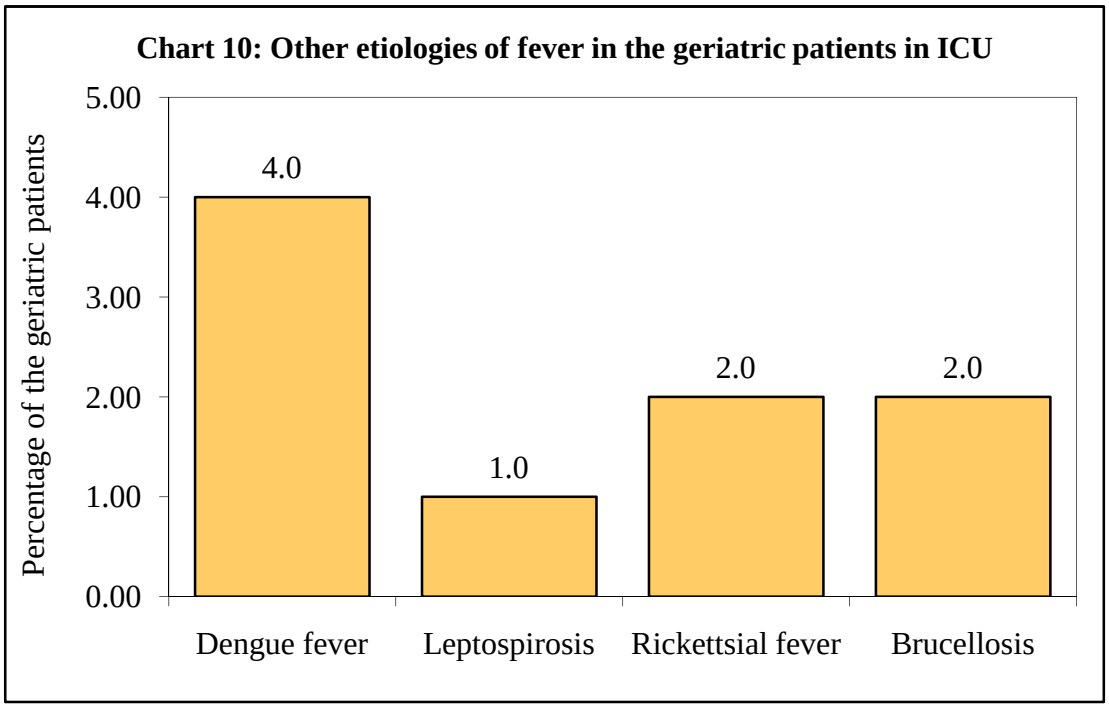
Table 18: Organisms isolated from other sources in the geriatric patients in ICU with fever

Sl.No.	Other sources	No of patients	% of patients
	PUS		
1	Staphylococcus	3	3.00
2	Enterococcus	2	2.00
3	E.coli	1	1.00
	Total pus culture positive	6	6.00
	SPUTUM		
1	Enterococcus	3	3.00
2	Klebsiella	2	2.00
3	Acinetobacter	2	2.00
4	Aspergillus	1	1.00
5	Staphylococcus	1	1.00
	Total sputum culture positive	9	9.00

Table 19 and **Chart 10** shows the other etiologies of fever in geriatric patients admitted in ICU with fever.

Table 19: Other etiologies of fever in the geriatric patients in ICU

Sl.No.	Other etiologies of fever	No of patients	% of patients
1	Dengue fever	4	4.00
2	Rickettsial fever	2	2.00
3	Brucellosis	2	2.00
4	Leptospirosis	1	1.00



DISCUSSION

Studies regarding fever in geriatric patients admitted in ICU are less. But to plan for future healthcare policies, further studies must focus on geriatric patients. Managing the geriatric patients is challenging. Severe sepsis is more frequent in geriatric age groups and associated with increased morbidity, mortality. Timely management is required for better outcomes in these patients. Therefore, further clinical studies on the geriatric patients will help to decide appropriate management in future.

Sample size:

A comparison of sample size in the present study with the other studies is presented in **Table 20**. The sample size in the present study was 100. This was similar to the studies conducted by Arun V G, et al[53].

Table 20: Comparison of the sample size

Studies	Sample size
Present study	100
Arun V G, et al[53]	100
Wilson Benny Paul, et al[54]	68
A. Atahan Cagatay, et al[55]	185

Gender distribution:

A comparison of the gender distribution in the present study with the other studies is shown in **Table 21**. In the present study, out of the total 100 patients, 62 were males and 38 were females. This was consistent with the study done by Arun V G, et al[53]. The gender distribution showed varying results in the other studies done by Wilson Benny Paul, et al[54], and A. Atahan Cagatay, et al[55].

Table 21: Comparison of the gender distribution

Studies	Males	Females	Total
Present study	62(62%)	38(%)	100
Arun V G, et al[53]	64(64%)	36(36%)	100
Wilson Benny Paul, et al[54]	52(76.47%)	16(23.53%)	68
A. Atahan Cagatay, et al[55]	82(44.32%)	103(55.68%)	185

Males may be more affected due to increased co-morbidities as compared to females including smoking, alcohol intake. Diseases like pneumonia are more common in males due to increased risk factors like COPD which may develop due to smoking.

Age groups:

A comparison of age distribution with the other studies is presented in **Table 22**. Mean age was 70.27 years. This was similar to studies done by Wilson Benny Paul, et al[54], and A. Atahan Cagatay, et al[55]. In the present study, most common age group was 60-69 years.

Table 22: Comparison of the age groups

Studies	Mean age(in years)
Present study	70.27
Wilson Benny Paul, et al[54]	66.02 ± 5.9
A. Atahan Cagatay, et al[55]	69.7 ± 7.5

60-69 years group had the most patients. This because when patients enter into the geriatric age group, many biological changes accompany and co-morbid conditions increase. The patient are more prone for infections. Although these factors increase with increasing age, many patients meet untimely death due to various causes of fever. Therefore, less patients are found in 70-79 years and ≥80 years age groups when compared to 60-69 years group.

Clinical symptoms in the geriatric patients admitted in ICU with fever:

In the present study, all patients had fever since it was the inclusion criteria. Dyspnoea was the most the common symptom after fever and was seen in 27(27%) patients. This was followed by cough, seen in 18(18%) patients. The other symptoms were abdominal pain and vomiting. In a similar study done by Arun V G, et al[53],

dyspnoea was the commonest symptom after fever. It was seen in 40(40%) patients. In another study by A. Atahan Cagatay, et al[55], the commonest symptom was cough with expectoration(46%) followed by dyspnoea(27%). This can be attributed to the factor that respiratory diseases were more common which leads to symptoms like dyspnoea and cough. The abdominal pain, vomiting can be attributed to UTI which is the next main cause of fever in the geriatric patients.

Clinical signs in geriatric patients admitted in ICU with fever:

In the present study, the common clinical findings were tachycardia(82%), hypotension(30%), tachypnoea(36%). Crepitations and rhonchi was seen in 52% patients. Splenomegaly and hepatomegaly was seen in 12% patients and altered sensorium was seen in 8% patients. A study by A. Atahan Cagatay, et al[55] showed similar results.

Etiology of fever in geriatric patients admitted in ICU:

A comparison of the etiologies of fever in the present study with the other studies is presented in **Table 23**.

Table 23: Comparison of the etiologies of fever

Studies	Pneumonia	UTI	Skin infections
Present study	36%	28%	7%
A. Atahan Cagatay, et al[55]	24.8%	14%	12.4%
Aravind Kumar Anand, et al[56]	21.25%	30.5%	14%

In this study, the commonest cause was pneumonia(36%), followed by UTI(26%), cellulitis(7%). A. Atahan Cagatay et al[55] showed similar results. But in a study conducted by Aravind Kumar Anand, et al[56], UTI was more common than the lung infections and skin infections. It can be concluded the respiratory infections, UTI and the skin infections are the major cause of fever. Aravind Kumar Anand, et al[56], observed that among non infectious diseases, rheumatologic diseases(4.3%) were the most common cause followed by malignancies. 1 case of pituitary macroadenoma was seen in our study. Other causes were not seen mainly due to lesser sample size. Non infectious causes of fever, although rare are important, since immediate diagnosis and rapid initiation of treatment can reduce the mortality, and also reduce the resources and time spent on treating some unknown cause of fever. Out of the total 100 patients, 94(94%) patients presented with the complaints of fever. 6(6%) patients developed fever after admission. The causes include pneumonia in 4(4%) patients and bedsore was the cause in 2(2%) of patients.

Pneumonia:

A comparison of the incidence of pneumonia among various studies is depicted in **Table 24**. Current study showed pneumonia was the commonest etiology, seen in 36(36%) patients. Bacterial pneumonia was more than viral pneumonia. This was similar to the study done by L C Jennings, et al[57] . CAP was more common than VAP .Viral pneumonia was diagnosed based on clinical features, nasopharyngeal swabs sent for H1N1 testing, radiological imaging. H1N1 swabs were positive in 5(5%) patients. Other tests including PCR could not be carried out due to financial constraints.

Table 24: Comparison of the incidence of pneumonia

Studies	Bacterial pneumonia	Viral pneumonia
Present study	75%	25%
L C Jennings, et al[57]	71%	29%

Pneumonia is the commonest cause of fever in the geriatric patients in ICU. Many factors contribute to its increased incidence including decreased protective reflexes in the airway, decreased respiratory muscle strength, decreased mucociliary clearance, reduced compliance of the lung, reduced elastic recoil. Risk factors which lead to pneumonia include Diabetes(15%), ventilator(10%), COPD(8%), HIV(4%), Chemotherapy drugs. Out of 36 patients of pneumonia, VAP was seen in 4(11.11%) and CAP was seen in 30(88.89%) patients. Although bacterial pneumonia was more common than viral pneumonia, mortality with viral pneumonia is very high. Out of 36 pneumonia patients, 17 patients died. Among these, 8 patients were viral pneumonia and the rest 9 patients were bacterial pneumonia. This may be due to lesser known treatment for viral pneumonia and also increased mechanical ventilation with viral pneumonia which contributes to the poor prognosis. Other factors are the risk factors, complications related to pneumonia and the duration of stay in the hospital. Serum procalcitonin will help to differentiate as it will be markedly increased in bacterial pneumonia if associated with sepsis. This will help to start higher antibiotics in bacterial pneumonias.

UTI:

UTI is increased due to increased catheterization, hormonal changes, postvoid residual urine, uninhibited contractions and urothelial changes. UTI was seen in 26% patients. The urinary findings were normal in 75(75%) patients. 25(25%) patients showed increased WBCs in the urine. No growth in urine culture was seen in 80(80%) patients. Among the urine culture positive patients(20%), the most frequent organism was E.coli which was isolated in 8(8%) patients. Next was Klebsiella which was seen in 3(3%) patients. The other organisms included Candida(3%), Enterobacter(2%), Proteus(2%), Enterococcus (1%), Kluyvera(1%). Pramit Kakde, et al[58], showed similar results with the commonest organism isolated from the urine being E.coli followed by Klebsiella. 79(79%) of present study's patients showed normal findings in the USG. Among the abnormal USG(21%), the commonest abnormality seen was cystitis in 11(11%) patients. Next were pyelonephritis(7%), prostatis(2%), hydronephrosis(1%). The risk factors included Diabetes, catheterization, structural abnormalities in the kidney, obstructive pathologies. UTI is an important cause of morbidity and sepsis in geriatric patients and can vary from a simple cystitis to life threatening sepsis. Therefore, emphasis on rapid detection of UTI and its treatment should be made.

Duration of stay and outcome of geriatric patients admitted in ICU with fever:

A comparison of the duration of stay in the hospital among various studies is shown in **Table 25**. The results were not consistent with the other studies done by Arun V G, et al[53] and Wilson Benny Paul, et al[54]. Many patients were found in the 1-5 days group in our study.

Table 25: Comparison of the duration of stay in the hospital

Studies	Duration of stay in the hospital(days)
Present study	7.30
Arun V G, et al[53]	5.1
Wilson Benny Paul, et al[54]	12.9

A comparison of the outcome of patients among various studies is depicted in **Table 26.** Out of 100 patients, 3(31%) patients died and 69(69%) patients were discharged. Similar results were demonstrated by Arun V G, et al[53]. But, another study by Aravind Kumar Anand, et al[56], showed less mortality.

Table 26: Comparison of the outcome of patients

Studies	Death	Discharge
Present study	31%	69%
Arun V G, et al[53]	25%	75%
Aravind Kumar Anand, et al[56]	19%	81%

The varying results in the duration of stay can be due to the differences in the sample size in the various studies. Many patients were found in the 1-5 days group in our study. This is due to the fact that either the patient is affected with a serious disease leading to mortality or the patient may be treated on time with the appropriate medications and discharged early. The complications seen were sepsis(40%),

AKI(36%), Shock(30%), Ventilatory support(18%) which lead to mortality. Among these, mortality was seen in 18% with sepsis, 12% with AKI, 15% with shock and 10% with ventilatory support. Mortality is especially attributed to sepsis and MODS. The commonest cause of mortality was pneumonia(17%). In pneumonia, the mortality was seen in viral etiology(6%) and bacterial pneumonia(11%). UTI was the next common cause seen in 7(7%) patients. Sepsis is common due to bacterial infections including pneumonia and UTI which are the most common cause of fever in these patients. The fast recovery in the patients is attributed to detection of sepsis using appropriate investigations including serum procalcitonin, identifying the causative organism using cultures and rapid initiation of antibiotics.

Co-morbidities in the geriatric patients:

The study showed that commonest co-morbidity was Diabetes mellitus (51%). Next common were hypertension (35%), IHD(6%), hypothyroidism (4%), Alcoholic (1%) and PVD(1%). This was similar to others studies done by Arun V G, et al[53], and Aravind Kumar Anand, et al[56], which showed diabetes as the common co-morbidity seen in 44% and 28% patients respectively. Co-morbid states like diabetes, hypertension increase with aging. The comorbid conditions are attributable to the worsening of outcome of these patients.

Laboratory parameters :

A comparison of the laboratory parameters of patients among various studies is depicted in **Table 27**. The study conducted by Wilson Benny Paul, et al[54] showed similar results.

Table 27: Comparison of the laboratory parameters

Sl.No.	Parameters	Present study	Wilson Benny Paul, et al[54]
1	Anemia	52%	42.64%
2	Thrombocytopenia	41%	-
3	Leucocytosis	78%	-
4	ESR	57%	73.13%
5	CRP	52%	91.97
6	Raised creatinine	73%	37.31%
7	Hypoalbuminemia	67%	56.45%
8	PCT	77%	-

Anemia can be seen in enteric fever and dengue fever, but is not related to the fever in the geriatric patients. But, anemia is linked with poor prognosis since it may hinder the normal recovery from fever. Thrombocytopenia is seen in malaria, rickettsial fever, leptospirosis, septicemia, typhoid, borreliosis, HIV. Prompt treatment is important. Leucocytosis, ESR, CRP are inflammatory markers. Raised creatinine leads to the suspicion of AKI which may be due to hypotension, dehydration, direct toxic effects, sepsis, drugs used, and other co-morbidities. Serum PCT is a marker of sepsis. Sepsis was seen in 40% patients and serum procalcitonin was raised in 77% patients. So, even when sepsis was not seen, serum procalcitonin was raised and therefore, is an early marker of sepsis. Among the 77 patients with raised serum procalcitonin, 43 patients had blood or urine culture negative. Blood cultures take at least 72 hours to come whereas, serum procalcitonin can be done on the same day.

Therefore, even when cultures are negative, serum procalcitonin gives a clue regarding sepsis and to start antibiotics immediately.

Organisms isolated from blood culture in the geriatric patients in ICU with fever:

A comparison of the organisms isolated from blood cultures among various studies is depicted in **Table 28**. Studies conducted by Aravind Kumar Anand, et al[56], Grace CJ, et al[59], Greenberg BM, et al[60] showed similar results. The commonest organism cultured was Staphylococcus. Next organism was E.coli.

Table 28: Comparison of the organisms isolated from blood culture

Studies	Blood culture	Staphylococcus	E.coli
Present study	31%	20%	6%
Aravind Kumar Anand, et al[56]	28.75%	42.60%	31.30%
Grace CJ, et al[59]	40.3%	44.6%	-
Greenberg BM, et al[60]	-	24%	17%

Gram positive organisms are more common than gram negative. This is due to the fact that the most common etiology was pneumonia which is mostly caused by gram positive bacteria.

Organisms isolated from other cultures in geriatric patients in ICU with fever:

The other cultures included pus and sputum.

Pus culture was positive in 6(6%) patients and sputum culture was positive in 9(9%) patients. In pus culture, the commonest organism was Staphylococcus which

seen in 3(3%) patients, followed by Enterococcus which seen in 2(2%) patients. Julio Collazos, et al[61], observed that the commonest microorganism isolated was Staphylococcus seen in 30% patients.

In sputum culture, the most organism isolated was Enterococcus which was seen in 3(3%), followed by Klebsiella seen in 2(2%) patients, Acinetobacter in 2(2%) patients. In a study done by Vesna Cukic, et al[62], it was shown that in respiratory diseases, Streptococcus pneumoniae (9.58%) was the commonest organism. Next was Klebsiella (1.8%) followed by Staphylococcus(1.8%). The results were not consistent which is attributable to lesser number of patients.

The culture of pus and sputum will lead to identifying the specific organism and better targeted treatment against the same. This will lead to reducing the morbidity, mortality in geriatric patients. Sometimes, when other laboratory parameters are not giving any clues to the diagnosis, these may prove to be very useful.

Other etiologies of fever in geriatric patients in ICU:

Dengue fever was seen in 4(4%) , Rickettsial fever in 2(2%), Brucellosis in 2(2%), Leptospirosis in 1 (1%) . In a study conducted by Emily K Rowe, et al[63], on dengue fever in geriatric patients, the incidence was found to be 4.4%. Dengue is usually neglected in elderly and studies are limited which suggest that mortality is very high which may be due to hypotension, AKI and bleeding manifestations. Brucellosis presents with unusual signs in geriatric population. Gancheva, et al[64], showed leptospirosis in geriatric patients is linked with high mortality and needs intensive treatment. Few studies are available in Rickettsial fever in geriatric patients.

CONCLUSION

Based on the findings of this study, the most cause of fever in the geriatric patients admitted in ICU was pneumonia followed by UTI. Other causes should also be considered in geriatric patients. Mortality was seen in 31% patients. The mean duration of stay was 7.30 days. The commonest etiology of death was pneumonia. The most common co-morbidities seen were Diabetes mellitus followed by hypertension. The complications seen were sepsis, AKI, shock. In pneumonia, bacterial cause was more common than viral. Sepsis was seen in 40% patients and serum procalcitonin was raised in 77%. Serum procalcitonin is an early marker of sepsis. Blood culture showed Staphylococcus as the commonest organism isolated. Urine culture showed E.coli.

STRENGTHS OF THE STUDY

We could send blood culture for all the patients in our study. This lead to isolating the exact organism and knowing the sensitive pattern and initiating antibiotics. Serum procalcitonin was also sent for all the 100 patients. Serum procalcitonin was used in the present study which is marker of early sepsis and helps to differentiate bacterial from viral cause.

LIMITATIONS OF THE STUDY

PCR techniques and viral panels were not used to diagnose the viral pneumonias due to financial constraints.

SUMMARY

Geriatric population is the population whose age falls above 60 years. Fever has been defined as the anti meridiem temperature of more than 37.2°C (98.9°F) or the post meridiem temperature of more than 37.7°C(99.9°F).

Fever in geriatric population predisposes to higher morbidity, mortality. It is seen that, the increasing age in these patients is directly related to infectious susceptibility. The important factors which increase the infections in these patients include reduced immune function, environmental factors and low reserves.

Timely management is required for better outcomes in these patients. Therefore, more clinical trials and studies on the geriatric patients will help to decide appropriate management in future.

The important findings are summarized as below:

The study included a total of 100 geriatric patients admitted in ICU with fever or later developing fever.

Out of the total 100 patients, 62(62%) were males and 38(38%) were females.

The mean age was 70.27 years. 53(53%) patients were in 60-69 years group, 31(31%) were seen in 70-79 years group and 16 (16%) were in 80 years or above group.

In the duration of hospital stay, a total number of 46(46%) patients were in the 1-5 days group, 32(32%) in the 6-10 days group, 14(14%) in the 11-15 days group and 8(8%) in the 16 days or more group. The mean duration of stay was 7.30 days.

All patients had fever. Dyspnoea was the commonest symptom after fever and was seen in 27(27%) patients. This was followed by cough, seen in 18(18%) patients. The commonest cause of fever was pneumonia (36%), followed by UTI(26%), cellulitis (7%), viral fever(5%) and others. Only 6(6%) patients developed fever after admission. The causes included Pneumonia (4%) and Bedsores(2%).

Tachycardia was seen in 82(82%) patients. Hypotension was seen in 30(30%) patients, Tachypnoea in 36% patients.

Out of 100 patients, 31(31%) patients died and 69(69%) patients were discharged.

The most common cause of mortality was pneumonia (17%). UTI was the next common cause seen in 7 (7%) patients.

The commonest co-morbidity was Diabetes mellitus (51%). Next was hypertension (35%), IHD (6%), hypothyroidism (4%), Alcoholic(1%), PVD(1%).

The most common complication was sepsis seen in 40(40%) patients. This was followed by AKI (36%), shock(30%), ventilatory support(18%).

Anaemia was detected in 52(52%) patients. TLC were raised in 78(78%) patients. Thrombocytopenia was detected in 41(41%) patients. ESR and CRP were raised in 57(57%) and 52(52%) patients respectively. In renal tests, urea was raised in 63(63%) patients and creatinine was increased in 73(73%) patients. In Liver function tests, total bilirubin was raised in 25(25%) patients. SGOT, SGPT were raised in 57(57%) and 32(32%) patients respectively. Hypoalbuminemia was seen in 67(67%) patients. Serum procalcitonin was raised in 77(77%) patients.

Out of 36 patients, bacterial pneumonia was seen in 27(75%) and viral pneumonia was seen in 9(25%) patients.

Urine was normal in 75(75%) patients. 25(25%) patients showed increased WBCs in the urine.

No blood culture growth was seen in 80 patients. Among the blood culture positive patients (20%), the commonest organism was E.coli which was isolated in 8(8%) patients. Next was Klebsiella which was isolated in 3(3%) patients.

79(79%) patients showed normal findings in the USG. Among the abnormal USG (21%), the commonest abnormality seen was cystitis in 11(11%) patients.

There was no growth in urine culture in 69(69%) patients. Among the urine culture positive patients (31%), the commonest organism was staphylococcus which was seen in 20(20%) patients. This was followed by E.coli(6%), Enterococcus(2%), Klebsiella (2%), Acinetobacter(1%).

In pus culture, the commonest organism was Staphylococcus which was present in 3(3%) patients and in sputum culture, the commonest organism was Enterococcus which was seen in 3(3%).

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ANNEXURE I – CONSENT FORM

"CLINICAL PROFILE OF FEVER IN THE GERIATRIC PATIENTS ADMITTED IN ICU-A ONE YEAR HOSPITAL BASED CROSS SECTIONAL STUDY "

Principal Investigator:

Guide:

Introduction and Purpose:

Proportion of geriatric population is increasing in India. Geriatric population requires proper care. It's a challenge to ensure the quality of life in geriatric population. Fever is common in geriatric population and has a poor outcome. Fever increase the morbidity and mortality in this population. There are various causes of fever and evaluating fever in geriatric population is challenging as it has an 'atypical presentation' as compared to the general population. The signs and symptoms are difficult to interpret. If the fever in geriatric population is studied properly and the cause of the

fever is evaluated using the clinical features, and laboratory parameters, it can help in providing proper care to the geriatric population. Hence this study is being considered to fill the gaps in knowledge about the clinical profile of fever in geriatric patients admitted in ICU.

Procedure:

If you agree to be part of the research study, you will be asked the relevant history and will be subjected to relevant clinical examination and investigations. You will also have to give blood samples for the necessary investigations.

Risk and Benefits:

The only risk and possible discomfort you might get is while taking blood from your arm for the investigations. It may cause swelling, pain, redness (rarely happens) at the site from where the blood is drawn.

You may not be benefitted by these investigations but you will be part of this study which is going to be useful to others in the future.

Alternatives:

Taking part in this study is voluntary. You may choose not to take part in this study.

If you decide to take part you can later change your mind and withdraw from the study. Your decision will not change the present or future health care or other services that you receive. The study doctor or sponsor may stop your participation in this study at any time. If you choose not to take part in the study, you will receive the standard treatment for patients with your condition.

Privacy and Confidentiality:

All information collected about you during the course of this study will be kept confidential to the extent permitted by law. The code numbers will identify you in this research record. Information from this study may be published but your identity will be confidential in any publication.

Institution / Sponsor's policy:

Does not apply to this research

Financial incentives for participation:

You will not be paid / offered any gifts /incentives for participating in the study.

Authorization to publish the results:

The results of the study would be forwarded to the KLE University, Belagavi as part of requirement towards the completion of MD degree, review and publishing.

In case of the queries during study or in future you may contact following persons:

Dr. Roopa M Bellad

Chairman,

JNMC Ethical

Committee for Human Research

J.N Medical College, Belagavi

Phone No: 9480275601

CONSENT FORM

I voluntarily agree to take part in this study by signing below. I may withdraw at any time. I am not giving up any of my legal rights by signing this form. My signature below indicates that I have read this consent form, or it has been read to me, and have had all the questions answered.

Signature / Left Thumb print of the Participant or legally authorized representative

Participant's Name: ……...

Signature / Left thumb impression: ……...

of the participant

Investigator's Name and Signature: ……...

Date:

Place:

ANNEXURE-II

PROFORMA

"CLINICAL PROFILE OF FEVER IN THE GERIATRIC PATIENTS ADMITTED IN ICU-A ONE YEAR HOSPITAL BASED CROSS SECTIONAL STUDY "

NAME		AGE/SEX	
IP NO.			
DOA		DOD	
DURATION		RESULT	
DIAGNOSIS			

CHIEF COMPLAINTS:

O/E:

Pulse rate: Blood pressure:

RR: Temp(oral):

Local examination:

S/E:

R/S: P/A:

CVS: CNS:

INVESTIGATIONS:	**DATE:**	**INVESTIGATIONS:**	**DATE:**
Hemoglobin		Urea	
Total leukocyte count		Creatinine	
Platelet count		Serum procalcitonin	
Erythrocyte sedimentation rate		CXR	
Packed cell volume		USG Abdomen	
C Reactive protein		Na,K,HCo3-	
Urine routine and microscopy		Total bilirubin Direct bilirubin Indirect bilirubin SGOT SGPT Alkaline phosphatase	
PS PS for malarial parasite		Urine culture	
Dengue IgG IgM NS1		Blood culture	
Widal test		Weil felix	
Leptospira		ET tube culture	
ANA screening			

DIAGNOSIS:

ANNEXURE-III- ETHICAL CLEARANCE LETTER

K.L.E.UNIVERSITY'S
JAWAHARLAL NEHRU MEDICAL COLLEGE,
NEHRU NAGAR, BELAGAVI-590010 (KARNATAKA-INDIA)
(Accredited 'A' Grade by NAAC)

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Ref: MDC/DOME/ 40 **Date: 22/11/2017**

To,

REG. NO. : BG0117005

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"CLINICAL PROFILE OF FEVER IN THE GERIATRIC PATIENTS ADMITTED IN ICU – A ONE YEAR HOSPITAL BASED CROSS SECTIONAL STUDY"**, is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

(Dr. Arathi Darshan)
Member Secretary
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

(Dr. Roopa M Bellad)
Chairman,
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

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ANNEXURES IV - MASTER CHART

CASE NO.	IP NO.	AGE	SEX	DURATION OF STAY	OUTCOME	COMPLAINTS	DIAGNOSIS	CO-MORBIDITES	TEMP	BP	Hb	TLC	PLATELET	ESR	CRP	UREA	CREATININE	TB	DB	SGOT	SGPT	ALBUMIN	PCT	URINE	BLOOD CULTURE	URINE CULTURE	OTHER CULTURE	DENGUE	WIDAL	LEPTO	WEIL FELIX	CXR	USG	OTHER TESTS
		IN YEARS		IN DAYS	DEATH/DISCHARGE				°F	mmHg	12-15 g/dL	4-10 x10³/µL	150-450 x10³/µL	0-20 MM/1st Hr	0-5 mg/L	17-49 mg/dL	0.70-1.20 mg/dL	0.00-1.40 mg/dL	0.00-0.30 mg/dL	1-40 U/L	1-41 U/L	3.5-5.2 gm/dL	0.00-0.50 ng.mL											
1	906752	75	F	6	DISCHARGE	FEVER, VOMITING, DYSPNOEA	PNEUMONIA	HTN	101	90/60	12.6	21.2	269	16	0	19	0.77	1.35	0.35	16	14	3.5	0.21	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	RT LL CONSOLIDATION	NAD	NONE
2	906370	63	M	3	DEATH	FEVER, ABD PAIN, LOOSE STOOLS	PNEUMONIA	HTN, DM-2	101	70 SYS	12.8	11.5	54	58	80	88	4.06	2.09	1.71	53	23	5.8	0.91	N	E.COLI	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
3	906389	75	F	8	DISCHARGE	FEVER, ABD PAIN, LOOSE STOOLS, OLIGURIA	UTI	DM-2, HYPOTHYROID	100	130/80	10.7	29.8	151	32	60	108	3.93	2.78	2.69	31	19	3.4	13	WBC:PLENTY	E.COLI	ENTEROBACTER	NONE	NEG	NEG	NEG	NEG	N	B/L PYELONEPHRITIS	NONE
4	905978	78	M	5	DISCHARGE	FEVER, COUGH	PNEUMONIA	NONE	102.6	110/70	14.4	9.2	104	4	0	82	1.05	2.3	2.02	45	27	2.5	10.55	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	RT LL CONSOLIDATION	NAD	NONE
5	906727	61	M	7	DEATH	FEVER, VOMITING, DYSPNOEA	UTI	HTN	102	50 SYS	14.1	14.3	135	36	3	73	3.03	2.99	2.29	37	23	3.3	51.32	WBC:PLENTY	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	CYSTITIS	NONE
6	905865	72	M	2	DEATH	FEVER, ABD PAIN, VOMITING, LOOSE STOOLS	PNEUMONIA	HTN, DM-2, IHD	100.2	90/60	15.6	6.1	167	10	120	50	2.02	1.11	0.14	33	21	3.5	0.14	N	NO GROWTH	KLUYVERA	SPUTUM: KLEBSIELLA	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
7	905284	92	M	5	DISCHARGE	FEVER, COUGH, DYSPNOEA	PNEUMONIA	NONE	102	110/70	14.6	18.4	246	60	160	52	1.06	1.01	0.45	25	39	3.4	0.09	N	NO GROWTH	CANDIDA	NONE	NEG	NEG	NEG	NEG	RT LL CONSOLIDATION	NAD	NONE
8	905669	68	F	15	DISCHARGE	FEVER, DYSPNOEA	UTI	HTN, DM-2	101.2	120/80	9.5	12.5	177	8	40	91	1.56	1.2	0.6	25	30	2.5	6.8	WBC: 5-6	E.COLI	ENTEROBACTER	NONE	NEG	NEG	NEG	NEG	N	CYSTITIS	NONE
9	889894	84	F	1	DEATH	FEVER	UTI	DM-2	102	120/80	10.8	12.1	43	90	1	97	3.43	0.95	0.75	366	229	3.2	0.78	WBC: SHEETS	STAPHYLOCOCCUS	E.COLI	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
10	889287	61	M	8	DISCHARGE	FEVER, COUGH	BRUCELLOSIS	HTN, DM-2	100.2	90/60	12.8	13.7	96	28	20	75	1.42	2.22	1.43	236	123	2.4	46.86	N	E.COLI	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	BRUCELLA
11	889954	68	M	3	DEATH	FEVER, ABD PAIN, VOMITING	ACUTE PANCREATITIS	ALCOHOLIC	100.2	70 SYS	10.5	1.2	15	12	3	94	2.84	2.86	2.78	48	26	3	18.56	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	PANCREATITIS	NONE
12	888356	85	F	11	DISCHARGE	FEVER	PNEUMONIA	NONE	102	100/80	12.8	17	373	34	68	29	0.83	0.35	0.13	31	14	4.1	24.4	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
13	891330	78	F	1	DEATH	FEVER	PITUITARY MACROADENOMA	HTN	102	120/80	8.3	15.32	79	8	106	109	1.4	2.74	1.46	12	10	2.3	16.38	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
14	891213	75	M	4	DISCHARGE	FEVER, DYSPNOEA	CELLULITIS	NONE	102	80 SYS	15.8	14.7	183	46	35	43	2.39	0.78	0.22	110	84	4	90.12	N	STAPHYLOCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
15	892027	80	M	23	DISCHARGE	FEVER	UTI	NONE	101.4	100/60	16.5	13.4	215	44	0	35	1.19	1.23	0.38	29	10	4	12.3	WBC: 207	NO GROWTH	NO GROWTH	ET: ENTEROBACTER	NEG	NEG	NEG	NEG	N	CYSTITIS	NONE
16	892867	78	M	4	DISCHARGE	FEVER, LOOSE STOOLS, VOMITING	PNEUMONIA	NONE	103	100/60	12.4	9.4	184	6	1	77	1.9	1.24	0.4	32	17	3.9	3.18	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	RT UL CONSOLIDATION	NAD	NONE
17	877137	60	M	4	DISCHARGE	FEVER, ALTERED SENSORIUM	INFECTED ULCER	PVD	102.4	70 SYS	10.4	37.1	629	28	48	10	0.78	1.07	0.55	56	13	1.9	96	N	STAPHYLOCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
18	892422	65	F	3	DEATH	FEVER, ABD PAIN, DYSPNOEA	UTI	HTN, DM-2	100.4	130/80	9.6	30.7	390	15	2	97	3.83	1.3	0.6	96	48	2.6	5.98	WBC: 10	STAPHYLOCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
19	891336	87	M	4	DISCHARGE	FEVER	PNEUMONIA	NONE	101.6	110/70	14.7	17.3	105	12	180	91	1.3	0.53	0.17	133	36	2.9	12	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
20	891980	70	F	2	DEATH	FEVER, HEADACHE	BEDSORE	HTN	101.4	130/90	11	18	216	60	4	51	1.35	1.02	0.37	235	43	3.7	1.6	N	STAPHYLOCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
21	891361	65	F	9	DISCHARGE	FEVER,COUGH, DYSPNOEA	PNEUMONIA	HTN, DM-2	102.2	120/70	11	18.1	385	9	196	65	1.2	0.28	0.1	31	20	3.5	0.36	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
22	891353	60	F	25	DISCHARGE	FEVER, ABD PAIN, VOMITING	UTI	HTN, DM-2	103	50 SYS	11	32.4	229	68	49	100	2.68	0.45	0.25	44	32	2.8	46	WBC: 19	E.COLI	E.COLI	NONE	NEG	NEG	NEG	NEG	N	RT PYELONEPHRITIS	NONE
23	891450	60	M	1	DEATH	FEVER	STROKE	NONE	102.4	170/90	15.5	21.4	241	12	0	34	1.29	0.8	0.37	63	13	4.5	2.6	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
24	886960	65	M	8	DISCHARGE	FEVER, VOMITING	UTI	NONE	101.8	80 SYS	9.8	10.8	310	46	38	81	5.12	3.6	1.2	30	20	3.5	68	WBC:PLENTY	KLEBSIELLA	KLEBSIELLA	NONE	NEG	NEG	NEG	NEG	N	B/L PYELONEPHRITIS	NONE

25	891239	60	M	5	DISCHARGE	FEVER	VIRAL FEVER	NONE	102	120/80	13.7	7.8	126	56	2	31	0.69	0.34	0.14	11	45	0.1	1.08	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
26	902722	72	F	13	DISCHARGE	FEVER, ALTERED SENSORIUM, VOMITING	PNEUMONIA	HTN	102.8	100/80	10.9	12.5	101	14	46	49	1.8	2.31	1.89	54	30	2.8	2.1		NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
27	903189	86	M	4	DISCHARGE	FEVER, DYSPNOEA	CELLULITIS	HTN, DM-2	103.2	100/60	12.1	14.3	178	68	58	53	1.33	1.07	0.49	27	24	3.9	2.8	N	NO GROWTH	NO GROWTH	PUS: STAPH	NEG	NEG	NEG	NEG	N	NAD	NONE
28	902645	65	F	3	DISCHARGE	FEVER	VIRAL FEVER	HTN, DM-2	103	110/70	13.7	4.1	24	72	76	41	0.93	0.46	0.28	61	71	2.1	1.2	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
29	902135	64	F	4	DISCHARGE	FEVER, LOOSE STOOLS	VIRAL FEVER	NONE	100.2	90/60	8.2	0.5	87	8	2	36	1.23	1.37	1.01	15	20	3.2	1.4	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
30	902415	78	M	5	DEATH	FEVER	INFECTED ULCER	DM-2	103.6	90/60	9	11.6	327	44	112	126	3.95	0.48	0.27	19	32	3.1	0.26	N	NO GROWTH	E.COLI	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
31	899220	80	M	11	DISCHARGE	FEVER, ALTERED SENSORIUM	SCRUB TYPHUS	NONE	103.4	100/60	12.6	10.9	113	4	0	101	3.7	0.59	0.46	62	30	3.5	2.2	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	OX-19	N	NAD	NONE
32	900650	73	M	3	DISCHARGE	FEVER, DYSPNOEA	PNEUMONIA	NONE	102.3	100/70	9.4	8.2	266	76	193	18	0.62	0.6	0.33	67	43	3.7	1.4	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	RT LL CONSOLIDATION	NAD	NONE
33	886960	65	M	8	DEATH	FEVER, VOMITING	UTI	NONE	103.4	120/80	9.8	10.8	310	2	2	81	5.12	1.04	0.6	23	22	3.1	12	WBC:PLENTY	KLEBSIELLA	KLEBSIELLA	NONE	NEG	NEG	NEG	NEG	N	CYSTITIS	NONE
34	898500	74	M	17	DEATH	FEVER, COUGH, DYSPNOEA	PNEUMONIA	DM-2	101.8	130/80	10.7	14.9	345	38	4	29	0.84	0.87	0.49	15	28	2.3	0.41	N	NO GROWTH	NO GROWTH	SPUTUM: ENTEROCO	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
35	898728	65	M	8	DISCHARGE	FEVER, OLIGURIA	UTI	NONE	102.3	100/70	13.8	10.4	25	10	38	178	4.57	1.2	0.89	58	39	3.4	29.52	WBC: 10-15	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
36	898772	71	M	13	DISCHARGE	FEVER, COUGH, CHEST PAIN	PNEUMONIA	HTN, DM-2	103.6	100/6	12.9	12.1	227	46	49	75	0.87	0.83	0.43	48	56	3.1	14.6	N	STAPHYLOCOCCUS	NO GROWTH	SPUTUM: ACINETO	NEG	NEG	NEG	NEG	RT LL CONSOLIDATION	NAD	NONE
37	878371	63	M	12	DISCHARGE	FEVER, OLIGURIA, DYSPNOEA	INFECTED ULCER	DM-2	102.4	90/60	7.6	14.1	150	14	112	63	2.24	1.31	1.17	14	15	2.4	68	N	STAPHYLOCOCCUS	NO GROWTH	PUS: STAPH	NEG	NEG	NEG	NEG	N	NAD	NONE
38	898099	78	M	12	DISCHARGE	FEVER, ABD PAIN, BURNING MIC	UTI	DM-2, HYPOTHYROID	101.3	120/80	12.1	5.2	77	36	0	44	1.69	0.57	0.36	48	41	3.9	0.1	WBC: 145	NO GROWTH	CANDIDA	NONE	NEG	NEG	NEG	NEG	N	PROSTATITIS	NONE
39	896324	71	M	14	DISCHARGE	FEVER, COUGH, DYSPNOEA	PNEUMONIA	NONE	103.4	120/80	9.7	12.3	606	12	136	23	0.71	3.75	3.17	93	48	2.1	0.9	N	STAPHYLOCOCCUS	NO GROWTH	SPUTUM: KLEBSIELLA	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
40	895881	62	M	8	DISCHARGE	FEVER, ABD PAIN	UTI	NONE	102.4	90/60	14.6	13	128	90	180	87	5.79	1.21	0.79	48	46	3.4	8	WBC: 10	E.COLI	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	B/L PYELONEPHRITIS	NONE
41	897951	77	F	15	DISCHARGE	FEVER, ALTERED SENSORIUM	BEDSORE	HTN, DM-2	104	90/60	8.7	22.9	206	68	0	27	0.92	0.79	0.51	19	8	1.8	3.78	N	STAPHYLOCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
42	898500	74	M	35	DEATH	FEVER, COUGH	PNEUMONIA	DM-2	101.3	110/70	10.7	14.9	345	9	26	29	0.84	0.87	0.49	15	28	3.1	0.41	N	NO GROWTH	NO GROWTH	SPUTUM: ENTEROCO	NEG	NEG	NEG	NEG	RT UL CONSOLIDATION	NAD	NONE
43	895422	64	M	4	DISCHARGE	FEVER	DENGUE FEVER	HTN	102	120/80	12.7	13.6	70	28	76	70	1.96	0.6	0.1	132	374	2.6	1.2	N	NO GROWTH	NO GROWTH	NONE	IGM	NEG	NEG	NEG	N	NAD	NONE
44	897006	75	F	6	DISCHARGE	FEVER, COUGH	UTI	HTN, DM-2	100.8	120/80	14.1	6.7	133	38	64	211	2.67	2.02	1.28	108	188	3.1	3.88	N	STAPHYLOCOCCUS	E.COLI	NONE	NEG	NEG	NEG	NEG	N	CYSTITIS	NONE
45	895389	65	M	8	DEATH	FEVER, VOMITING	PNEUMONIA	NONE	102.4	90/60	11.8	6	70	13	2	201	7.24	2.78	2.23	50	40	4.5	3.04	N	STAPHYLOCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
46	902604	70	M	1	DEATH	FEVER, DYSPNOEA	CELLULITIS	HTN	104	60 SYS	8.7	29	311	76	3	57	3.55	0.72	0.52	128	89	2.3	0.4	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
47	902610	60	F	5	DEATH	FEVER, CHEST PAIN	PNEUMONIA	NONE	100.2	100/60	9.3	6.7	142	4	106	34	1.88	0.4	0.19	38	16	4.4	0.51	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
48	902638	65	F	27	DISCHARGE	FEVER, OLIGURIA	CELLULITIS	NONE	103.4	90 SYS	9.1	28.3	76	38	1	36	9.48	1.4	0.8	64	42	3.1	100	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
49	902090	69	F	11	DISCHARGE	FEVER, LOOSE STOOLS	UTI	NONE	103.4	110/70	9	7	174	13	0	96	317	0.48	0.23	157	90	4.2	0.26	WBC: 10	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	CYSTITIS	NONE
50	895293	70	M	11	DISCHARGE	FEVER, CHEST PAIN	PNEUMONIA	HTN, IHD	102.4	120/80	11.1	28.9	235	80	146	52	2.17	0.94	0.36	42	12	3.3	86.64	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	LT LL CONSOLIDATION	NAD	NONE
51	922541	64	M	17	DISCHARGE	FEVER	DENGUE FEVER	HTN, DM-2	102.4	120/90	16.4	27.5	9	2	1	89	1.27	1.08	0.7	102	59	3.1	0.4	N	NO GROWTH	NO GROWTH	NONE	IGM,IGG	NEG	NEG	NEG	N	NAD	NONE
52	915276	69	F	3	DISCHARGE	FEVER, BURNING MIC	UTI	DM-2	102.4	110/70	8	8	102	44	28	56	2.29	2.23	2.07	47	46	2.1	3.25	WBC: 10-15	ACINETOBACTER	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	B/L PYELONEPHRITIS	NONE
53	920069	66	M	5	DISCHARGE	FEVER, ALTERED SENSORIUM	BRUCELLOSIS	DM-2	104.6	120/80	9.4	16.8	110	14	114	223	4.36	0.97	0.58	77	31	4	5.33	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	BRUCELLA
54	927163	80	F	6	DEATH	FEVER, COUGH, CHEST PAIN	PNEUMONIA	HTN	103.4	90/60	12.6	10.9	25	12	0	154	1.63	0.16	0.1	54	25	4	1.44	N	STAPHYLOCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	LT LL CONSOLIDATION	NAD	NONE
55	939497	100	M	6	DISCHARGE	FEVER	DENGUE FEVER	HTN, IHD	104	110/70	9.2	5.3	150	7	68	57	2.23	1.59	0.51	37	16	2.2	27.41	N	STAPHYLOCOCCUS	NO GROWTH	NONE	IGM	NEG	NEG	NEG	N	NAD	NONE
56	923620	68	F	5	DEATH	FEVER, ABD PAIN	UTI	DM-2	102.4	60 SYS	8.6	24.5	481	56	2	27	1.21	1.4	0.61	22	15	3.1	12.4	WBC: 10	NO GROWTH	ENTEROCOCCUS	NONE	NEG	NEG	NEG	NEG	N	CYSTITIS	NONE
57	917871	75	F	1	DEATH	FEVER	PNEUMONIA	NONE	104.2	90/60	11	12.1	96	1	2	37	0.88	0.26	0.11	17	14	2.4	0.76	N	STREPTOCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	LT LL CONSOLIDATION	NAD	NONE
58	937899	87	M	4	DISCHARGE	FEVER, DYSPNOEA	BEDSORE	DM-2	104	140/90	10.4	25.3	36	78	56	55	1.48	0.47	0.09	61	20	3.5	5.97	WBC: 17	STAPHYLOCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
59	914513	62	F	6	DISCHARGE	FEVER	VIRAL FEVER	NONE	102	120/80	12.2	8.2	232	44	3	13	0.43	0.87	0.37	15	12	4.5	0.02	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE
60	916782	75	F	7	DISCHARGE	FEVER, VOMITING	UTI	DM-2	103.6	120/80	10.6	24	199	6	0	135	4.74	0.31	0.27	48	34	3	59.6	WBC: 513	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	CYSTITIS	NONE
61	922019	78	M	7	DISCHARGE	FEVER, DYSPNOEA	PNEUMONIA	IHD	103.4	90/70	14.7	32.9	409	36	36	35	1.69	0.6	0.43	29	21	3	1.46	N	ENTEROCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
62	933427	63	M	7	DEATH	FEVER, DYSPNOEA	PNEUMONIA	HTN	102.3	120/80	15.1	8.6	228	8	5	38	1.39	1.79	0.61	33	32	2.8	0.27	N	NO GROWTH	PROTEUS	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
63	926761	70	M	7	DISCHARGE	FEVER	BEDSORE	DM-2	104	90/60	11.4	20.3	273	4	0	196	5.54	0.33	0.22	19	32	2.8	0.44	N	STAPHYLOCOCCUS	NO GROWTH	PUS: ENTEROCOCCUS	NEG	NEG	NEG	NEG	N	NAD	NONE
64	926722	85	M	9	DISCHARGE	FEVER, VOMITING	UTI	DM-2	102.4	120/80	10.9	11.5	170	78	26	100	2.96	1.6	0.8	56	36	3.1	0.4	WBC: PLENTY	NO GROWTH	E.COLI	NONE	NEG	NEG	NEG	NEG	N	PROSTATITIS	NONE
65	934561	61	M	6	DISCHARGE	FEVER, COUGH	PNEUMONIA	HTN	102.6	120/80	11.1	16.7	497	80	4	59	0.82	0.98	0.63	132	119	4.8	1.55	N	STAPHYLOCOCCUS	NO GROWTH	SPUTUM: STAPH	NEG	NEG	NEG	NEG	LT LL CONSOLIDATION	NAD	NONE
66	904057	62	M	11	DISCHARGE	FEVER, DYSPNOEA	CELLULITIS	DM-2	104	60 SYS	10.7	30.3	260	14	2	76	3.74	0.51	0.3	52	48	5.3	48.11	N	NO GROWTH	NO GROWTH	PUS: STAPH	NEG	NEG	NEG	NEG	N	NAD	NONE
67	903623	60	M	20	DEATH	FEVER, DYSPNOEA	PNEUMONIA	DM-2	104	110/70	11	3.8	164	56	12	38	1.13	0.4	0.21	125	42	3.4	0.17	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE
68	872931	85	M	1	DEATH	FEVER, BURNING MIC	UTI	NONE	103.8	120/80	13	13.5	196	12	36	106	1.4	1.27	0.9	40	72	5	60	WBC: 57	NO GROWTH	E.COLI	NONE	NEG	NEG	NEG	NEG	N	CYSTITIS	NONE

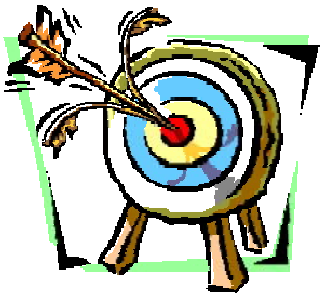
69	873208	60	M	1	DEATH	FEVER, COUGH, DYSPNOEA	PNEUMONIA	DM-2	102	110/70	13.1	38.6	277	78	3	66	1.49	0.5	0.2	16	13	2.1	12.45	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	RT UL CONSOLIDATION	NAD	NONE	
70	885400	86	F	5	DISCHARGE	FEVER, BURNING MIC	UTI	HTN, DM-2, HYPOTHYROID	102.4	130/80	11.8	17.6	365	6	2	31	1.1	0.23	0.09	24	20	1.7	46	WBC: 242	NO GROWTH	E.COLI	NONE	NEG	NEG	NEG	NEG	N	B/L PYELONEPHRITIS	NONE	
71	903697	65	M	3	DISCHARGE	FEVER, COUGH, DYSPNOEA	PNEUMONIA	NONE	102.9	90 SYS	9	11.9	325	66	112	45	1.72	0.3	0.11	70	28	3.5	0.18	N	ENTEROCOCCUS	NO GROWTH	SPUTUM: ENTEROCO	NEG	NEG	NEG	NEG	LT LL CONSOLIDATION	NAD	NONE	
72	894825	65	F	6	DISCHARGE	FEVER, DYSPNOEA	UTI	DM-2	103.2	110/90	16.8	9	346	80	0	34	0.88	0.47	0.15	22	20	4.1	0.03	N	NO GROWTH	E.COLI	NONE	NEG	NEG	NEG	NEG	N	CYSTITIS	NONE	
73	870882	65	M	4	DISCHARGE	FEVER, ALTERED SENSORIUM	ACUTE MENINGOENCEPHALITIS	NONE	103.2	120/80	15.9	19.4	296	56	64	59	2.37	0.5	0.29	121	137	4.3	26	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE	
74	923867	65	F	7	DISCHARGE	FEVER	CELLULITIS	HTN, DM-2	104	60 SYS	9.9	16.3	243	9	79	76	1.95	1.46	0.9	69	72	3.2	62	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE	
75	934194	85	M	1	DEATH	FEVER, CHEST PAIN	PNEUMONIA	DM-2	103.4	90 SYS	15	24.6	182	44	0	64	2.09	1.75	0.94	122	92	3.7	60	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	LT UL CONSOLIDATION	NAD	NONE	
76	920895	63	M	6	DISCHARGE	FEVER, ABD PAIN	UTI	HTN	102.6	80 SYS	9.4	13.4	289	46	89	125	3.38	15.97	14.71	75	38	3.1	6.8	N	NO GROWTH	KLEBSIELLA	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE	
77	900199	62	M	7	DEATH	FEVER, COUGH, DYSPNOEA	PNEUMONIA	DM-2	102.4	100/60	13.7	3.1	104	11	2	38	1.56	0.35	0.16	51	34	3.7	0.52	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE	
78	904732	70	M	5	DISCHARGE	FEVER, COUGH	PNEUMONIA	NONE	102.4	60 SYS	12.6	15	314	70	1	25	0.96	1.92	0.92	25	37	2.5	0.81	N	NO GROWTH	NO GROWTH	SPUTUM: ACINETO	NEG	NEG	NEG	NEG	RT UL CONSOLIDATION	NAD	NONE	
79	873775	65	F	7	DISCHARGE	FEVER, ALTERED SENSORIUM	ACUTE MENINGOENCEPHALITIS	HYPOTHYROID	103	130/80	8.9	9.9	108	38	36	53	1.04	0.29	0.14	45	50	2.8	10	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE	
80	935133	60	F	6	DISCHARGE	FEVER, CHEST PAIN	PNEUMONIA	HTN, DM-2	102.3	90 SYS	12.9	13.8	299	12	0	19	0.75	0.89	0.54	75	41	3.4	0.22	N	STAPHYLOCOCCUS	NO GROWTH	SPUTUM: ASPERGIL	NEG	NEG	NEG	NEG	LT LL CONSOLIDATION	NAD	NONE	
81	902936	66	F	11	DEATH	FEVER, COUGH, DYSPNOEA	PNEUMONIA	HTN	103.8	80 SYS	15.9	10.6	234	14	56	37	0.76	0.59	0.12	46	51	3.1	3.02	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE	
82	893199	69	M	13	DISCHARGE	FEVER, ABD PAIN	ACUTE PANCREATITIS	NONE	102.4	90/60	11.2	6.6	306	80	0	36	0.73	0.93	0.4	14	12	3.8	0.42	N	NO GROWTH	NO GROWTH	PUS: E.COLI	NEG	NEG	NEG	NEG	B/L PLEURAL EFFUSION	PANCREATITIS	NONE	
83	850573	62	M	5	DISCHARGE	FEVER, HEADACHE	LEPTOSPIROSIS	DM-2	102.6	110/70	10.4	6.1	98	11	112	107	2.01	5.72	5.4	65	30	2.6	5.6	WBC: 16	NO GROWTH	NO GROWTH	NONE	IGM	NEG	IGM	NEG	N	NAD	NONE	
84	923598	70	F	8	DISCHARGE	FEVER	SCRUB TYPHUS	DM-2	102	90/70	11.1	12.2	79	46	54	60	2.08	1.12	0.83	31	24	3.8	1.18	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	OX-19	N	NAD	NONE	
85	900163	62	F	1	DEATH	FEVER, COUGH, DYSPNOEA	PNEUMONIA	HTN, DM-2	101.8	90 SYS	12.5	18.4	481	38	1	143	2.83	0.55	0.3	15	11	3	0.29	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	LT LL CONSOLIDATION	NAD	NONE	
86	892384	66	M	2	DEATH	FEVER, DYSPNOEA	PNEUMONIA	HTN, DM-2	104	70/50	12.4	22	171	46	24	125	3.02	1.6	0.8	42	36	2.6	12	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE	
87	927163	80	F	6	DISCHARGE	FEVER	CELLULITIS	DM-2	104	60 SYS	12.6	10.9	25	16	0	154	1.63	0.16	0.1	54	25	2.6	1.44	N	STAPHYLOCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE	
88	900554	66	F	5	DISCHARGE	FEVER, DYSPNOEA	PNEUMONIA	IHD	101.4	70 SYS	11.2	7.7	281	76	2	23	0.56	0.3	0.1	73	29	3.4	16	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE	
89	903612	79	F	16	DISCHARGE	FEVER, COUGH, DYSPNOEA	UTI	HTN	103.2	120/80	6.2	11.4	222	80	79	78	4.01	0.58	0.29	38	23	3.1	26	WBC: 15	NO GROWTH	PROTEUS	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE	
90	937850	65	F	5	DEATH	FEVER, CHEST PAIN	PNEUMONIA	DM-2	102.4	90/60	13.1	10.8	170	44	0	16	0.57	0.46	0.18	32	22	3.3	1.4	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE	
91	882095	63	M	7	DISCHARGE	FEVER, ALTERED SENSORIUM	ACUTE MENINGOENCEPHALITIS	DM-2	102	120/80	14.8	14.1	87	12	46	77	1.49	1.27	0.86	107	74	3.4	2.6	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	NAD	NONE	
92	945436	70	M	5	DEATH	FEVER, HEADACHE	ACUTE MENINGOENCEPHALITIS	DM-2, IHD	103.2	110/70	12.9	12	1.89	36	2	67	0.75	0.45	0.25	16	11	3.3	2	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NN	N	NAD	NONE	
93	894122	71	M	5	DISCHARGE	FEVER, ABD PAIN	SPONTANEOUS BACTERIAL PERITONITIS	DM-2	103.6	90/60	9.4	19	15	7	2	31	0.48	3.56	3.05	138	80	2.7	1.08	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	CLD	NONE	
94	941352	70	M	6	DISCHARGE	FEVER, COUGH	PNEUMONIA	DM-2	103.4	90/60	13.4	11	159	50	36	82	1.92	2.48	2.11	42	40	3	9.69	N	NO GROWTH	CANDIDA	NONE	NEG	NEG	NEG	NEG	B/L CONSOLIDATION	NAD	NONE	
95	902316	60	M	3	DISCHARGE	FEVER, ABD PAIN	ACUTE CHOLECYSTITIS	DM-2	102.4	60 SYS	15.5	12	226	44	32	51	1.14	5.97	4.6	46	113	4.1	2.68	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	CHOLECYSTITIS	NONE	
96	901496	68	M	8	DISCHARGE	FEVER, LOOSE STOOLS	UTI	HTN, DM-2	104	60 SYS	13.4	16.5	529	60	3	225	3.67	0.7	0.3	44	42	3.2	0.25	WBC: 10	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	B/L HYDRONEPHROSIS	NONE	
97	855076	70	M	1	DEATH	FEVER, ABD PAIN	UTI	DM-2	102.4	120/80	11.7	16.8	203	8	0	98	4.44	0.48	0.39	56	32	3.4	26.4	WBC: 21	STAPHYLOCOCCUS	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	CYSTITIS	NONE	
98	908936	68	M	4	DISCHARGE	FEVER, ABD PAIN	ACUTE CHOLECYSTITIS	DM-2	103	70 SYS	12.5	9.4	154	56	46	22	1.09	0.7	0.29	12	13	3.7	6.9	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	CHOLECYSTITIS	NONE	
99	931446	60	F	7	DISCHARGE	FEVER, ABD PAIN	UTI	NONE	101.8	90 SYS	11.5	16.8	199	12	1	65	2.49	1.4	0.6	38	116	2.1	4.6	N	NO GROWTH	NO GROWTH	NONE	NEG	NEG	NEG	NEG	N	RT PYELONEPHRITIS	NONE	
100	**931611**	**80**	**F**	**1**	**DISCHARGE**	**FEVER**	**VIRAL FEVER**	**HTN, DM-2**	**101.3**	**120/80**	**13.8**	**7.9**	**369**	**60**	**20**	**28**	**0.92**	**0.25**	**0.1**	**14**	**13**	**4.6**	**0.2**	**N**	**NO GROWTH**	**NO GROWTH**	**NONE**	**NEG**	**NEG**	**NEG**	**NEG**	**N**	**NAD**	**NONE**	

ANNEXURE-V

KEY TO MASTER CHART

Sex:		
1	M	Male
2	F	Female
Complaints:		
3	Abd pain	Abdominal pain
4	Burning mic	Burning micturition
5	Diagnosis	
6	UTI	Urinary Tract Infection
Co-morbidities:		
7	HTN	Hypertension
8	DM-2	Diabetes Mellitus
9	IHD	Ischaemic Heart Disease
10	PVD	Peripheral Vascular Disease
Examination:		
11	°F	Fahrenheit
12	BP	Blood Pressure
Investigations:		
13	Hb	Haemoglobin
14	TLC	Total Leukocyte Count
15	ESR	Erythrocyte Sedimentation Rate
16	CRP	C-reactive Protein
17	TB	Total Bilirubin
18	DB	Direct Bilirubin
19	SGOT	Serum Glutamic Oxaloacetic Transaminase
20	SGPT	Serum Glutamic Pyruvic Transaminase
21	PCT	Procalcitonin
22	Lepto	Leptospirosis

Introduction



Objectives

Review of Literature

Methodology

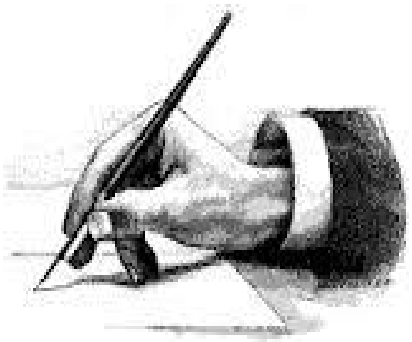
Results

Discussion

Conclusion

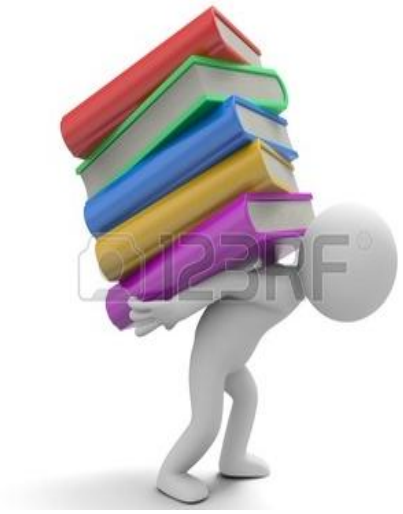
Summary

Bibliography



Annexure-I

Annexure-II



Annexure-III

Annexure-IV