A DISSERTATION ON

STUDY OF ASYMPTOMATIC BACTERIURIA IN PREGNANCY AND ITS EFFECT OF SCREENING AND TREATMENT IN MATERNAL AND FETAL OUTCOME

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ABBREIVATIONS

UTI	-	Urinary Tract Infection
ASB	-	Asymptomatic Bacteriuria
PET	-	Preeclamptic Toxemia
LBW	-	Low Birth Weight
PTL	-	Preterm Labour
PPROM	-	Preterm Premature Rupture of Memberanes
IDSA	-	The Infectious Diseases Socety of America
ACOG	-	American College of Obstetricians and Gynecologists
E.COLI	-	Escherchia Coli
IUGR	-	Intrauterine Growth Restriction
DMPA	-	Depot Medroxy Progestrone Acetate
WHO	-	World Health Organisation
PTL	-	Preterm Labour

Introduction:-

In the absence of clinical signs, asymptomatic bacteriuria refers to the colonisation of harmful bacteria in clean-catch urine.[1] It affects both pregnant and non-pregnant women,[2] as well as men and women of all ages and situations. Symptomatic and asymptomatic bacteriuria are both prevalent in pregnant women,[3] and while pregnancy does not increase the prevalence of asymptomatic bacteriuria, it does raise the pace at which silent disease progresses to symptomatic disease.[4]

A weakening of the immune system,[5] lower urine concentration due to increased plasma volume, and the formation of glycosuria in roughly 70% of pregnant women are among the physiological changes that accompany pregnancy; these features favour bacteria multiplication in urine.[6,7] Poor socioeconomic level, age, pregnancy duration, and multiparity are all linked to an increased incidence of asymptomatic bacteriuria.[8]

One of the causes of poor prenatal outcomes is asymptomatic bacteriuria. UTIs are very common in pregnant women. It can start as early as 6 weeks and last up to a year between the 22nd to 24th week of pregnancy.[9] Increased bladder caused by a decrease in bladder and ureteral volume as well as a decrease in bladder and ureteral tone. ureterovesical reflux and urinary stasis 70% of the time Glycuria is

a condition that affects a large percentage of pregnant women. Increases the formation of germs in the urine.[10]

Significant bacteriuria has been historically defined as finding more than 10^5 colony-forming units per mL of urine.[10] Asymptomatic bacteriuria is common, with a prevalence of 10 percent during pregnancy.[11,12]

In about 30% of patients with untreated asymptomatic bacteriuria, symptomatic cystitis develops, and in up to 50% of women, pyelonephritis develops.[13] Intrauterine growth retardation, low-birth-weight neonates, prematurity, and preterm labour and delivery are all linked to asymptomatic bacteriuria. [14]

During pregnancy, a urinary tract infection (UTI) is a common medical problem. It affects about 4 to 7 percent of pregnant women. Multiple factors contribute to the development of urinary tract infections (UTIs) during pregnancy, including structural and physiological changes in the urinary tract that cause ureter dilation and increase the likelihood of urine stasis.

Bacteriuria is a common and important complication of pregnancy1. The importance of symptomatic and asymptomatic bacteriuria in pregnancy has been evaluated extensively as have the pathogenesis and natural history of bacteriuria in pregnancy. Recent systematic reviews have further assessed the safety and efficacy of the antimicrobial agents used to treat asymptomatic bacteriuria and symptomatic

urinary tract infection (UTI) during pregnancy2,3,4.

The overall prevalence of bacteriuria in pregnancy varies from 4-7%, although a range of 2-11% has been reported.5,6. The prevalence increases with age, sexual activity, parity and sickle cell trait. Other factors associated with bacteriuria in pregnancy are lower socio-economic status, history of recurrent urinary tract infection, diabetes mellitus and anatomic or functional urinary tract abnormalities1.

The highest prevalence has been reported in the African-American multiparas with sickle cell trait while the lowest prevalence has been found in the affluent white women of low parity5. The prevalence rate among pregnant Nigerian women has been variously reported to be between 4-14.1%7,8,9.

Bacteriuria is typically present at the time of first pre-natal visit and only approximately 1-2% of pregnant women develop bacteriuria after a negative screening early in pregnancy1,10,11.

Pregnant women with asymptomatic bacteriuria are at a high risk for a number of complications for both mother and the unborn child 12. Maternal complications include overt urinary tract infection in 30-40% of patients as pregnancy advances. Whether or not symptomatic urinary tract infection ensues, the foetus is still

at risk for prematurity, low birth weight and even fetal wastage13. Thus, there is little if at all any doubt regarding the need for early screening for asymptomatic bacteriuria among obstetric patients. The condition is detectable and largely treatable. Its consequences are also preventable, hence screening for asymptomatic bacteriuria is justifiable and ultimately cost-effective14. Wadland and Plante in their cost analysis study reported that screening is cost-effective when prevalence of bacteriuria is above 2%15.The search for an ideal screening method to detect asymptomatic bacteriuria continues to propel research globally.

An ideal screening test should be inexpensive, simple, rapid and should have high sensitivity in addition to specificity16. Quantitative urine culture of a midstream clean-catch specimen has been widely recognized as the optimal screening test. However, performing a urine culture is expensive, requires laboratory facilities and competent personnel which may not be available in low resource settings12. Therefore, other bacteriuria screening methods have been described and used12,17. These include the relatively cheap and affordable dipstick test for nitrites and leucocyte esterase. Others include routine urinalysis, enzymatic method for detecting catalase in urine and the semi quantitative dipstick culture.

Generally, in our environment, there is insufficient local data to evaluate the use of cheaper and simpler methods of screening for bacteriuria in pregnancy. This is partly because, routine screening for asymptomatic bacteriuria is not practiced in most maternity units in this environment despite overwhelming evidence clearly

demonstrating its benefits in preventing symptomatic urinary tract infection and the associated adverse pregnancy outcome.

Furthermore, during pregnancy, glycosuria and amino-aciduria promote the proliferation of germs in the urine. In females, having a small urethra and being close to the vaginal opening increases the risk of UTI[15,16]. In pregnancy, a urinary tract infection (UTI) can be symptomatic or asymptomatic.

Hence this study was conducted to find the Asymptomatic Bacteriuria in pregnancy and its effect of screening and treatment in maternal and fetal outcome.

Aim and Objective:-

Aim:-

- To study the effect of screening treatment of asymptomatic bacteriuria on maternal and fetal outcome.

Objectives:-

- To find out the prevalance of asymtomatic bacteriuria in pregnancies less than 28 weeks period of gestation.
- To study the adverse maternal and fetal outcomes in the study group who were left untreated
- To study the maternal and fetal outcome in the study group who received treatment

Review of Literature:

Definition:-

It is also defined as the existence of bacteria that are actively multiplying and >105 cfu per mL of urine within the urinary tract, excluding the urethra, when the patient does not have any symptoms of a UTI.[17]

Asymptomatic bacteriuria is therefore the isolation of a specified quantitative count of bacteria in an appropriately collected urine specimen obtained from a person without symptoms or signs referable to urinary infection. Asymptomatic bacteriuria is diagnosed when a specified quantitative count of bacteria in an appropriately collected urine specimen isolated.Asymptomatic bacteriuria was defined as the presence of bacteria in a voided urine sample following bacterial colonisation of the urinary tract which does not cause symptoms.

TABLE 1 Microbiologic definition of asymptomatic[a] bacteriuria[b]

Criteria for ASB diagnosis
Two consecutive voided urine specimens (preferably within 2 wk) with the same bacterial species isolated in quantitative count of $>10^5$ CFU/ml in women, including pregnant women (1, 2)
A single voided urine specimen with one bacterial species isolated in a quantitative count of $>10^5$ CFU/ml in men (1, 2)
A single catheterized urine specimen with one or more bacterial species isolated in a quantitative count of $>10^5$ CFU/ml in either women or men (1) or $\geq 10^2$ CFU/ml of a single bacterial species from a single catheterized urine specimen (2)
Any urine specimen with $>10^4$ CFU/ml of group B *Streptococcus* is significant for ASB in a pregnant woman (3)

[a]No signs or symptoms referable to the urinary tract, e.g., typical urinary tract symptoms include urinary frequency, urinary urgency, lower abdominal pain, pelvic pain, and/or flank pain.
[b]Presence of more than one bacterial type indicates contamination with organisms normally found on the skin. The presence of yeast in the urine of asymptomatic patients is almost always the result of external genital tract colonization, and there are no consistent diagnostic criteria to define significant infection (7).

Background:-

When bacteria are found in the urine of a person who has no symptoms of a urinary tract infection (UTI), this is known as asymptomatic bacteriuria (ABS).[18] Despite the fact that ASB affects only a small percentage of newborns and toddlers, women are at a higher risk than men, and the risk increases with age.[19] The majority of people with ASB do not develop symptomatic UTIs and have no negative repercussions.[20] However, pregnant women's urinary tracts experience architectural and physiological alterations, as well as changes in their immune systems, all of which enhance the risk of ASB.[21] In nearly 70% of instances, ASB is a substantial risk factor for UTIs in women who are pregnant.[22]

During pregnancy, ASB increases the risk of a UTI with symptoms, which can lead to pyelonephritis and severe obstetric outcomes such as early delivery, low birth weight, and increased foetal mortality.[23] Additionally, ASB can cause pre-eclamptic toxaemia, anaemia, intrauterine growth retardation, preterm labour, preterm premature rupture of the membrane, and post-partum endometritis.[24] There is enough data to suggest that an ASB-positive pregnant woman should be treated.[25]

Researchers recommend routine culture screening for all pregnant women who visit antenatal clinics because of the negative consequences of undetected ASB on the mother and child,[26] as well as to protect the mother and newborn child from any subsequent infection-related issues. Culturing is still the most effective

screening method for detecting ASB.[27] A routine urine culture test for prenatal patients is unusual in many countries, including India and other poor countries.[28] The key reason for this technique is the time factor for culture results and the cost involved (typically a 48-hour interval is required for culture results), when strip urinalysis is used to detect the presence of glucose and protein.[29]

Despite the fact that ASB is linked to poor pregnancy outcomes, screening and treatment are underutilised.[30] The majority of Indian literature suggests Antibiotic vulnerability patterns and the presence of ASB respondents from a variety of health centres.

Epidemiology:

The prevalence of ASB has been estimated to be between 2–10 percent worldwide.[31] However, different studies show that prevalence is higher, such as 25.3 percent in Odisha,[32] and 17 percent in Rajasthan. Andhra Pradesh has 16 percent, Lucknow has 17 percent, and Uttar Pradesh has 23.9 percent. Nigeria.[33]

Urinary tract infection (UTI) is a frequent clinical condition that accounts for 1–6% of all medical referrals.[37] It comprises infections of the urinary system, bladder, and kidneys. UTIs can be symptomatic or asymptomatic, with asymptomatic bacteriuria (ASB) being especially dangerous due to the lack of symptoms.[38] Around

150 million people die each year as a result of urinary tract infections and its consequences.[39]

The incidence of bacteriuria in pregnant Iranian women has been estimated to be 2–41%.[40] As a result, the findings of studies are inconsistent. As a result, assessing the prevalence of ABS, UTI, and the like is crucial. Bacteria that are most commonly engaged in Its creation provides a valuable diagnostic capacity in a variety of situations in different countries.

ASBP is believed to affect 2–11 percent of people worldwide, however greater rates have been documented in Uganda.[57,58] Women with diabetes mellitus and gestational diabetes, as well as women with a poor socioeconomic position and a history of urinary tract infection, are at an elevated risk of ASBP.[59] Women with ASBP are more likely to have negative maternal outcomes, such as a 30–40% incidence of pyelonephritis, which can lead to foetal outcomes such as early birth and low birth weight.[60]

Anatomy and Physiology of Urinary Tract:-

From proximal to distal, the urinary tract is made up of renal papillae, renal pelvis, ureters, urinary bladder, and urethra.[67] Upper urinary tract includes kidney and ureters. Urinary bladder and urethra are part of the lower urinary tract. The kidneys are responsible for removing unwanted waste (water soluble) from the bloodstream as well as assisting in the re-absorption of essential elements such as water, amino acids, and glucose.[68] The urinary tract excretes toxic and metabolic products produced by the kidney. Collection, transit, storage and evacuation of urine is the fundamental function of the urinary tract.[69]

Urine is produced in the kidney and transferred to the urinary bladder via the ureters, which are tubular structures. This urine is accumulated in the urinary bladder (a muscular organ) before its excretion through the urethra. In general most of the urinary tract is sterile save the distal urethra. Asymptomatic bacteriuria is caused by the invasion of bacteria beyond the urethra.[70]

Urine is an odourless, straw-colored liquid with a pH of 4.5-8 and a specific gravity of 1.003-1.032. Urine osmolarity ranges from 40 to 1350. Urine excretion rates range from 1-2 litres per day to 3 litres per day. Cells such as RBCs, WBCs, and pus cells are not eliminated in regular urine. Protein is rarely eliminated in urine. Proteinuria shows infection-related damage to the glomeruli.[71] Bacteriostatic properties of urine include high osmolarity, acidic or low pH, and a high urea content. Changes in these features of urine provide an ideal environment for bacterial development.[72]

Types of Urinary Tract Infection:

Can be classified into asymptomatic or symptomatic.

Symptomatic urinary tract infections are further divided:

Upper urinary tract infection: pyelonephritis or infection involving kidney.

Lower urinary tract infection: cystitis or infection of urinary bladder symptoms of urinary tract include frequent urination, pain during micturition, blood in urine and urgency. Systemic symptoms such as fever with chills, flank pain and low back ache are usually seen in upper urinary tract infection.

Risk factors for Urinary Tract Infections:

- Women are at increased risk of developing urinary tract infection as compared to men because in women urethra is placed close to the anus.
- Low socioeconomic status
- Poor genital hygiene and lack of education
- Sexual activity at a very young age
- Elderly gravida
- Few medical and immunocompromised conditions such as pregnancy, diabetes Mellitus, Aquired immuno deficiency syndrome/ HIV, renal stones or anamolies of urinary tract, nosocomial infections
- Prolonged hospital stay or catheterization.[73]

PATHOGENESIS

The urinary tract undergoes significant changes during pregnancy that impact on the development and the natural history of bacteriuria during pregnancy. In non-pregnant women, asymptomatic bacteriuria may not be persistent and may be inconsequential. However in pregnancy, bacteriuria is more likely to be persistent and associated with subsequent development of symptomatic UTI1. During pregnancy, hydroureter begins in the 1st trimester and progresses until term, returning to normal within several weeks post partum in most women28.

Dilated ureters may contain more than 200mls of urine and this contributes to the persistence of bacteriuria in pregnancy. The changes are more pronounced on the right ureter. Other factors responsible for the persistence of bacteriuria and later development of symptomatic UTI in pregnancy include influence of hormonal changes which causes decreased ureteral peristalsis after the second month of gestation with long periods of atony seen in the seventh and eighth months of pregnancy, increased bladder capacity and longer kidney length. Hormonal and other physiological changes may also increase susceptibility to UTI29,30.

The physiological increase in plasma volume during pregnancy decreases urine concentration and increases urinary progestins and estrogens which may lead to a decreased ability of the lower urinary tract to resist invading bacteria.

Changes in pH and osmolality of urine and pregnancy induced glycosuria and aminoaciduria may also facilitate bacterial growth.

Microorganism causing Asymptomatic bacteriuria:

The gram-negative bacteria Escherichia coli is the most prevalent bacteria that causes urinary tract infection in pregnant women. Klebsiella pneumoniae, Proteus mirabilis, Enterobacter species, Pseudomonas, and gram-positive bacteria like Streptococcus, Staphylococcus, and Enterococcus are among the bacteria that cause asymptomatic bacteriuria.[74] The gold standard test for diagnosing asymptomatic bacteriuria in pregnancy is urine culture. Other screening procedures, such as the nitrate test and the leucocyte esterase test, can be performed to check for asymptomatic bacteriuria in pregnant women.[75]

Pregnant women are two times more likely to be impacted than non-pregnant women of the same age. The cause of this is urine stasis caused by the progesterone action during pregnancy, as well as many anatomical changes that occur during pregnancy.[79] Various studies in the west have estimated the prevalence of asymptomatic bacteriuria in pregnancy to be between 2 and 7%, while in India, it was estimated to be between 5 and 17 percent. 6-10 African studies revealed a higher frequency than both of these regions. 11 Escherichia coli (80–85 percent) is the most

common organism, followed by coagulase-negative Staphylococcus species, Klebsiella species, Pseudomonas species, and Proteus species. [80,81]

Urine culture is the gold standard test for detecting asymptomatic bacteriuria. 1-3 As a result, urine culture should be considered as a screening test of choice at the first prenatal visit or between 12 and 16 weeks of pregnancy.[82]

Screening Test:

Pyuria is diagnosed by a wet film examination of uncentrifuged urine. A 0.05 ml (50 l) of well mixed uncentrifuged urine sample was carefully put to the middle of a microscope slide. A 22 X 22 mm coverslip was immediately attached, avoiding trapped bubbles, so that the film would display a slight excess of fluid around the coverslip's margins. The prepared film was examined under a high-powered microscope. More than 1 leukocyte per 7 high power fields equates to more than 104 leukocytes per ml, which is termed severe pyuria. [84]

Microorganisms are detected using a Gram stain of well-mixed uncentrifuged urine. The smear is fixed, stained, and examined under oil immersion after a drop of well mixed urine is allowed to air dry (1000 X).[86] In a midstream, clean-catch, Gram-stained, uncentrifuged urine, the presence of at least one bacterium per oil immersion field correlates with 105 bacteria per ml of urine or more. After assessing at least 20 oil immersion fields, Smear is ruled out as a negative.[85]

Urinary nitrite detection- 1.5 g of sulphanillic acid was dissolved in 450 ml of 10% acetic acid to make the Griess reagent. This was then added to a 0.6 gm -naphthylamine solution diluted in 60 ml boiling distilled water. When stored in a sealed amber bottle and kept refrigerated, the reagent will last several months. The appearance of a pink tint indicates that the test reagent is deteriorating. If the reagent develops a pink tint, it can be regenerated by aggressively mixing it with small amounts of metallic zinc powder and filtering it. In a clean test tube, mix 1.0 ml of urine with 1.0 ml of the reagent. A positive reaction occurs when a pink tint changes to a dark red colour quickly, indicating the presence of nitrites in the urine. Because of the potential dangers, the -naphthylamine was handled with caution.[87]

A test tube was filled with 1.5 to 2 mL of urine. In the test tube, four drops of 10% hydrogen peroxide were added, and the mixture was gently shaken for five seconds. Within 1 to 2 minutes of adding the hydrogen peroxide, effervescence sufficient to produce a complete ring or layer on the liquid's surface was classified as a positive discovery. When there was no effervescence or the ring of effervescence was incomplete after two minutes, the test was declared negative.[88]

Physiological changes in Pregnancy and ASB:

Progesterone, a pregnancy hormone, lowers peristalsis and muscular tone, causing dilation of the renal pelvis and ureter, resulting in decreased urine flow, urinary stasis, and hydronephrosis. The uterus enlarges as the pregnancy progresses, obstructing the passage of urine and causing urinary stasis. Bladder tone is reduced, and bladder capacity is enhanced. When combined with insufficient emptying, this can result in a vesicoureteric reflex, which can lead to bacterial migration. These changes in pregnancy create an ideal environment for germs to thrive.

During pregnancy, the pH of urine rises, making it ideal for bacteria to flourish. Glycosuria is common during pregnancy because the glomerular filtrate is increased, and glucose from the glomerular filtrate cannot be entirely reabsorbed by the renal tubules. Excess glucose in urine provides an ideal environment for bacteria to thrive.

If neglected, asymptomatic bacteriuria during pregnancy can lead to pyelonephritis. Untreated bacteriuria can lead to preterm labour, anaemia, hypertensive problems, postpartum endometritis, and chorioamnionitis in the mother. Prematurity, low birth weight, IUGR, perinatal mortality, and morbidity are examples of neonatal complications.

Several theories exist to explain the link between pyelonephritis and preterm labour:

Pyogens cause an increase in myometrial activity. Endotoxins are produced by Gram negative bacteria and have an oxytocic action on myometrium cells. Endotoxins can pass the placenta and cause premature labour in the foetus. Bacterial enzymes like collagenase and proteases can break membranes and induce labour to begin. Bacterial compounds such as endotoxins and phospholipase increase the production of prostaglandins in the decidua, resulting in the commencement of labour. Prostaglandins are produced when bacteria produce chemicals that stimulate cells such as macrophages and monocytes, resulting in labour. Prostaglandin secretion is initiated by cytokines (interleukin-1 and 6, platelet activating factor, tumour necrosis factor), which are released when macrophages and monocytes are activated. [78]

PREGNANCY

Pregnancy is a condition which has unique changes in urinary system both anatomically and physiologically.

Though ASB does not cause any serious effect in women who are not pregnant, it makes antenatal women more susceptible to

pyelonephritis .

The following physiological changes take place during pregnancy:

Ureteric and renal pelvic dilatation starts as early as the 8th week of gestational age which is frequently found on the right side (86%) .The degree of dilatation of calyx is also pronounced on the right(15 mm vs 5 mm).[12,13,14]

There is anterior and upward shift in the position of bladder.

Vascularity increases.

Bladder volume increases to 1500 ml.

The compressing effect of the gravid uterus is the principle reason of hydroureteronephrosis.[13]

The progestrogenic effect on smooth muscle causes relaxation of it which in turn causes reduced ureteric peristalsis, increase in bladder volume & stasis of urine.

Urinary pH, osmolality ,glycosuria due to pregnancy and aminoaciduria facilitates growth of bacteria. Glycosuria occurs because of impairment of resorption by collecting tubule &Henle's loop. Though the mechanism of

aminoaciduria is not known, it influences the adhesion of E.coli to urothelium.[12,13,14]

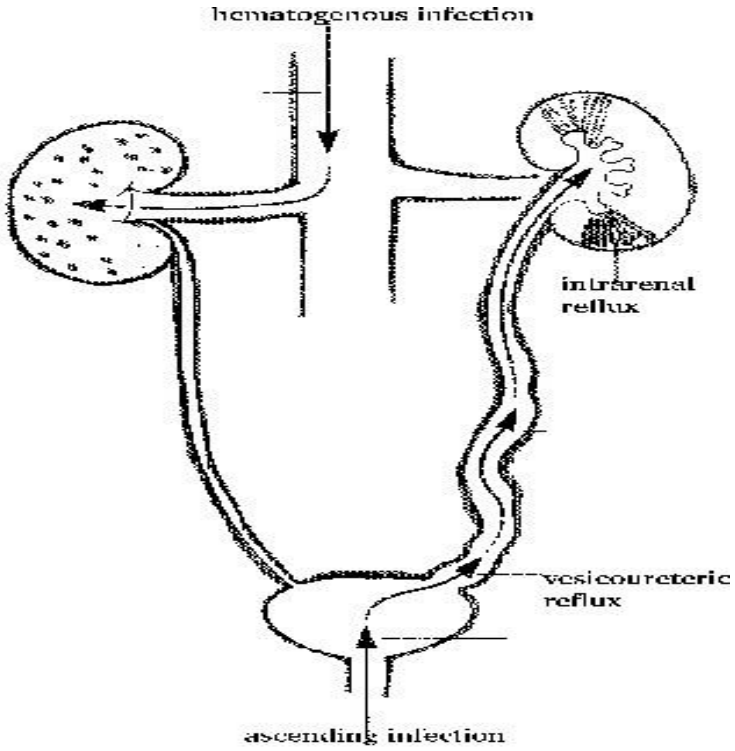
GFR (50%) and urine output are increased due to increase in blood volume.

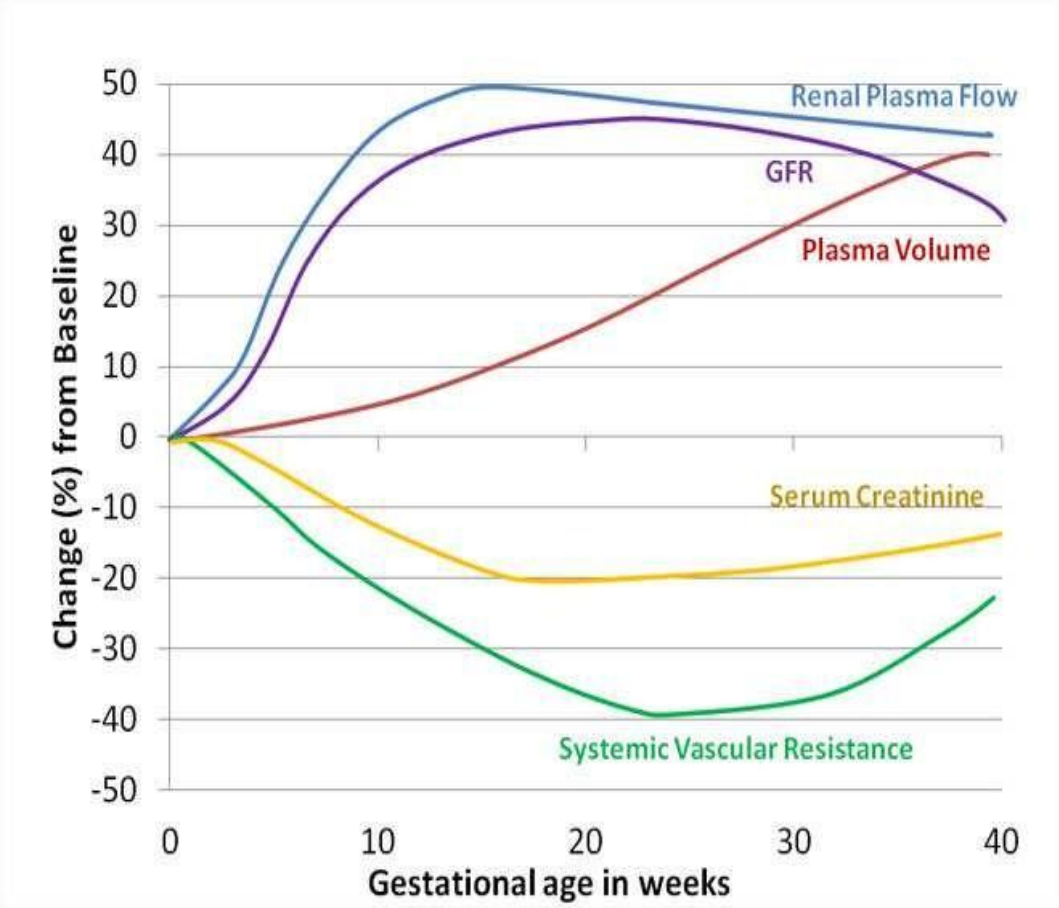
Fall in serum creatinine & blood urea nitrogen.

Rate of flow of urine & rate at which sodium is excreted alters with change in position -2 times greater with LLP than supine position.

Renin starts to rise from 1st trimester & rises till term.

Less susceptible to the effects of angiotensin 2.





EPIDEMIOLOGY OF ASYMPTOMATIC BACTERIURIA IN PREGNANCY:

UTI is the bacterial infection which occurs commonly in pregnant women.

Many recent studies state that ASB occurs in 2 to 10 % of all pregnant women which is found to be similar in most

countries.[15,16,17] [*Eyalsheiner et al,Abdullah et al,samad et al,Shameel et al]*

UTI & ITS NATURAL COURSE IN WOMEN

Relapse:

Infections occuring within 7 days of initial treatment it is called as relapse.

It is commonly due to the presence of proximal urinary tract infection or functional & anatomical abnormalities in urinary system.

However reinfection is not related to abnormal urinary tract.

Recurrent UTI:

Recurrent UTI is more common in women.

More than three episodes of urinary tract infections confirmed with culture in the past one year or two episodes in the past six months.

It occurs in females with normal urinary tract because of increased ability of Escherichia coli to adhere to the urothelium and because of E.coli colonizing the vagina in abundance.

Other important external factor leading to recurrence of UTI in a healthy female is sexual activity.

Asymptomatic bacteria and Pregnancy:-

Asymptomatic bacteriuria (ASB) is defined as a substantial bacteriuria without signs or symptoms of a urinary tract infection (UTI). Pregnant women with ASB are more likely to give birth prematurely. Pre-eclampsia and/or low-birth-weight newborns develop pre-eclampsia and/or low-birth-weight infants develop pre-eclamp[42,43] polyhydramnios Other health problems linked to Transient renal failure and acute respiratory distress are examples of ASB. Shock and haematological abnormalities are all symptoms of the condition. Which occur in cases that aren't being treated or aren't being managed properly Urinary tract infections and pyelonephritis in women.[44]

Morbidity has also been connected to pregnancy in both men and women.[40] Mother and foetus Bacteria that can be grown are called cultivable bacteria. The number of people who have recovered from ASB infections is under fourteen. Despite the fact that non-culturable infections have also been discovered,[45] has been implicated. The Enterobacteriaceae family is to blame. Almost all occurrences of asymptomatic bacteriuria (90%) are caused by E. coli is the most common pathogen. Enterococcus spp., Enterococcus spp., Enterococcus s Coagulase-negative Staphylococcus aureus Staphylococci ASB is also a possibility.[46]

According to the IDSA Guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults, all pregnant women should be tested for bacteriuria by urine culture at least once during their pregnancy, and if the results are positive, therapy is warranted. Patients undergoing transurethral resection of the prostate and other urologic operations in which mucosal bleeding is predicted must be screened for and treated for silent bacteriuria. However, no reference can be found for asymptomatic bacteriuria screening or treatment in renal transplant or other solid organ transplant recipients.[48]

Karikari AB et al did a study on Assessment of asymptomatic bacteriuria and sterile pyuria among antenatal attendants in hospitals in northern Ghana. They found that Asymptomatic bacteriuria was found in 20 and 35.5 percent of the 390 and 90 women examined at Tamale Central and Tamale Teaching Hospital, respectively. 66 percent of the 50 women who presented at Tamale Central Hospital had sterile pyuria. Staph aureus and coagulase-negative Staph were found in more than 64% of isolates collected from ASB patients (CoNS). Among the enterobacteriaceae isolates, Escherichia coli was the most common species. Gentamicin and amikacin had the highest susceptibility, while ampicillin, cotrimoxazole, chloramphenicol, and nitrofurantoin had the most resistance. There was 28.8% resistance to imipenem and vancomycin. to 52 percent, with 81 to 92 percent of strains displaying multiple drug resistance.

The frequency of asymptomatic bacteriuria in the southern part of the country is significantly greater (20–35.5 percent) than published rates. 66 percent of women have sterile pyuria, which can indicate asymptomatic renal impairment and is frequently ignored in prenatal care. Treatment failure may occur if UTIs are treated empirically at the Tamale Central and Teaching Hospital without confirmation of susceptibility. Because of the problems associated with ASB and SP, it is vital to screen and treat pregnant women for these disorders.

Previous research in Uganda found that the prevalence of asymptomatic bacteriuria among pregnant women ranged from 12.2% to 13.1 percent.[58] The most prevalent bacteria recovered from women with ASBP were E. coli, Staphylococcus epididymis, Staphylococcus aureus, and Klebssiela pnuemoniae.[61] However, unlike many other poor and middle income nations, Uganda does not regularly screen for ASBP during prenatal care. The burden, bacterial aetiology, and sensitivity pattern of ASBP in women in Eastern Uganda are all unknown. Furthermore, most uropathogens have developed antimicrobial drug resistance, making treatment of the women affected difficult.[62] This is worsened further by the rise in multidrug-resistant bacteria that are resistant to the most routinely used antibiotics.[63]

Symptomatic urinary tract infection (UTI), pyelonephritis, preeclamptic toxaemia (PET), anaemia, low birth weight (LBW), intrauterine growth retardation (IUGR), preterm labour (PTL), preterm premature rupture of membrane (PPROM), and post-partum endometritis[65] are some of the maternal and foetal complications linked to it. Although first trimester screening and treatment for ASB during pregnancy is standard of care in developed countries, and the role of specific antimicrobial therapy in pregnancy is well established6, information on the impact of antimicrobial therapy for ASB during pregnancy is not available from developing countries. However, there is strong evidence that bacteriuria is ubiquitous in India and its neighbouring countries.[66]

Up to 10% of pregnant women experience asymptomatic bacteriuria, compared to 1% to 5% of healthy premenopausal women. ASB in pregnancy has been linked to low birth weight, preterm delivery, stillbirths, and progression to symptomatic UTI, including pyelonephritis, in studies dating back to the 1960s. The most well-documented effect of untreated ASB in pregnant women is an increased risk of acute pyelonephritis, which can be fatal to both the mother and the baby. Because few contemporary research have been published, the incidence of pyelonephritis related with ASB in pregnancy has been reported to be as high as 25 to 36 percent in older studies, and these older data have guided guidelines.[89,90]

In the Netherlands, a more recent multicenter prospective cohort study of nearly 4,000 pregnant women (age 18) between 16 and 22 weeks of pregnancy was done (14). ASB screening was carried out using a single point-of-care dipslide (UricultW; Orion Diagnostica, Espoo, Finland) containing cysteine lactose electrolyte-deficient medium and MacConkey medium, and was considered positive when a single microorganism had 105 CFU/ml or when two different colony types were isolated but at least one had 105 CFU/ml.[91] The randomised controlled portion of the trial, which compared 5 days of treatment with either nitrofurantoin or placebo, was open to women with ASB. The incidence of pyelonephritis was modest in pregnant women without ASB (0.6 percent, 24 of 4,035 women), but it rose to roughly 2.5 percent (5 of 208 instances) when untreated or placebotreated ASB was present (adjusted odds ratio, 3.9; 95 percent confidence intervals, 1.4 to 11.4).

More research is needed to see if this is applicable to pregnant women who are at higher risk or who have varying access to health care. Pregnancy remains one of the contexts in which screening and treatment for ASB is suggested by many medical associations to lower the rate of pyelonephritis and related consequences, based on currently available data. The IDSA, ACOG, and AAP advocate urine culture screening early in pregnancy, however the USPTF and AAFP propose screening from 12 to 16 weeks of pregnancy or at the first prenatal appointment if it happens later.[89,90]

Girishbabu RJ et at did a study on Asymptomatic bacteriuria in pregnancy to find the prevalence of asymptomatic bacteriuria in pregnant women and also to isolate, identify and establish antimicrobial susceptibility pattern of the pathogens responsible for Asymptomatic Bacteriuria. They found that A total of 100 people (10%) tested positive for bacteriuria. The most common organism was Escherichia coli, which was followed by Klebsiella pneumoniae. The most efficient antibiotics against urine isolates were pipercillin-Tazobactum, amikacin, and nitrofurantion. In the population investigated, asymptomatic bacteriuria is not prevalent among prenatal patients. All prenatal patients should have a routine urine culture test to detect any infection that may be present. This step will go a long way toward minimising pregnancy-related maternal and obstetric problems.

In a prospective cohort study of pregnant women with no signs of urinary tract infection, Jain et al discovered that 16.9% of them had asymptomatic bacteriuria. They discovered that early detection and treatment of asymptomatic bacteriuria resulted in a considerable reduction in problems for the mother and infant in a sample of women. They also discovered that detecting asymptomatic bacteriuria late in pregnancy increased the risk of preterm labour, preterm premature rupture of membranes, pre-eclamptic toxaemia, intrauterine growth retardation, and low birth weight, even after the bacteriuria was treated. They came to the conclusion that screening for asymptomatic bacteriuria should be part of standard antenatal care, and bacteriuria positive cases should be treated for the mother's and neonate's safety.

Urinary tract infections:-

The invasion of germs and the ensuing multiplication on part or the entire urinary system is known as urinary tract infection (UTI).[49] It is the most frequent bacterial-related disease in pregnancy, and if diagnosed and treated incorrectly, it can lead to difficulties in the neonates of these moms. UTI, as one of the most common acquired illnesses, is clearly linked to an increase in the rate of stillbirths.[50,51]

UTI and its consequences account for over 150 million deaths worldwide each year.[52] Infections of the urinary tract in pregnancy are classified as symptomatic or asymptomatic.[53] Asymptomatic bacteriuria is the most prevalent cause of UTI in pregnancy, affecting primarily the lower urinary tract, but symptomatic bacteriuria characterised by pyelonephritis might occur if the upper urinary tract is engaged.

Because of the small urethra, which can readily be infected with microorganisms from the gastrointestinal system, urinary tract infection is a common bacterial illness in women. Because of the anatomic and physiological changes that occur during pregnancy, which provide a suitable environment for bacterial proliferation, pregnant women are at a higher risk of urinary tract infection. Smooth muscle relaxation, dilatation of the ureters, and dilation of the renal pelvis, particularly the right due to compression from the expanding dextrorotated, are all effects of

progesterone in uterus. In addition to the urine's relative stasis as a result of diminished peristalsis there is glycosuria of pregnancy, as well as a general loss in immunity.

Pyuria:-

Sterile Pyuria is another urinary tract disease that is common during pregnancy (SP). Although there is no current definition,[55] SP is defined as a mid-stream urine specimen with 10 or more whitblood cells per cubic millimetre or a leukocyte esterase positive urinary dipstick test with no concomitant positive urinary culture.[56] The causes of sterile pyuria are many.

Lai YJ et al did a study on Asymptomatic pyuria in pregnant women during the first trimester is associated with an increased risk of adverse obstetrical outcomes. And found that the population had a 21.3 percent frequency of asymptomatic pyuria. Pyuria was the sole predictor linked to preterm delivery before 36 weeks of pregnancy, preterm premature rupture of membranes, and low birth weight in univariate analysis. Pyuria (odds ratio: 4.89, 95 percent confidence interval: 1.80-13.25, p=0.002) and a maternal age of 35 years or more (odds ratio: 3.46, 95 percent confidence interval: 1.11-10.78, p=0.033) were both significant independent predictors of a low 5 minute Apgar score (7) in multivariate analysis. Asymptomatic

pyuria detected by urinalysis in the first trimester may be a predictor of poor perinatal outcomes.[64]

Pyelonephritis:-

Screening for asymptomatic bacteriuria (ASB) is part of regular prenatal care because ASB affects 2 to 7% of pregnant women.[93] According to ACOG treatment recommendations, up to 40% of untreated pregnant women with ASB will develop a urinary tract infection (UTI), including pyelonephritis, with an 80% risk reduction if bacteriuria is eradicated.

There is no guidance available to inform the care of those individuals at somewhat higher risk of recurrent or persistent bacteriuria in the absence of substantial risk factors for recurrent or persistent bacteriuria, such as sickle cell trait or renal transplantation. Prior UTI, nulliparity, pre-existing diabetes mellitus, smoking, late presentation to care, and low socioeconomic position are also risk factors.[94] We present the case of a lady who was untreated in the antenatal time after contracting multidrug-resistant Klebsiella caused ASB, which progressed to pyelonephritis and perinephric abscesses before requiring radical nephrectomy in the postpartum era.

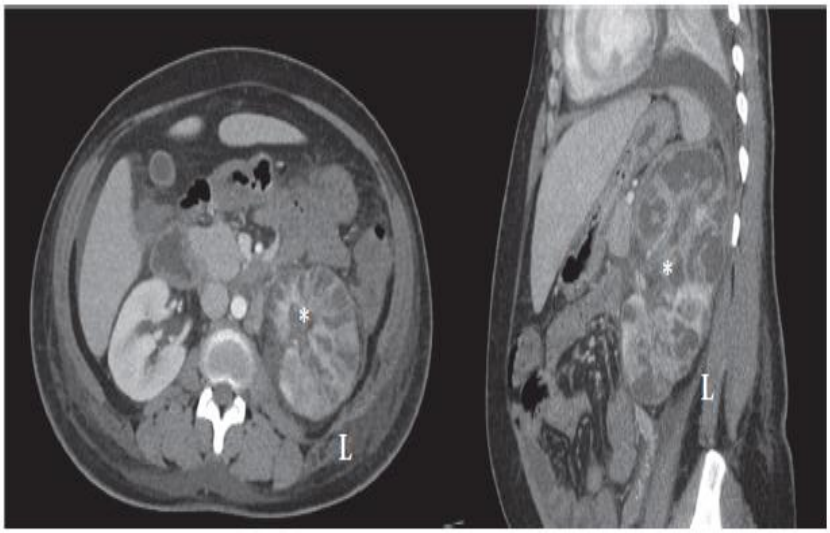


FIGURE 1: CT of abdomen, axial and sagittal views, with findings of multifocal areas of parenchymal infection and necrosis to left kidney*

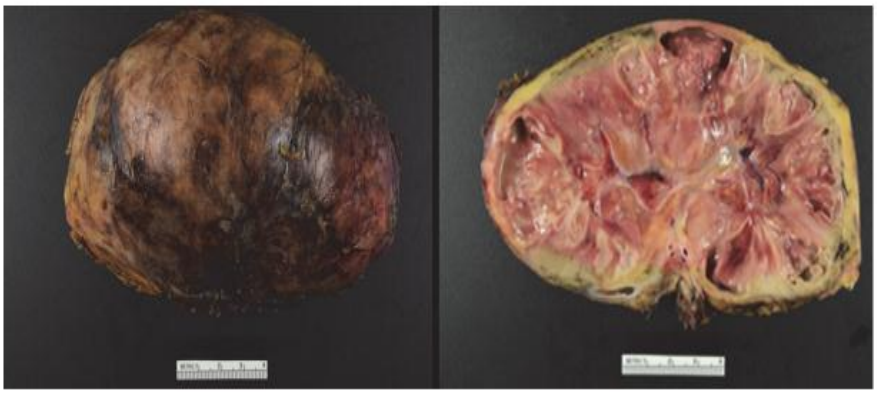


FIGURE 2: Renal parenchyma shows severe acute pyelonephritis with multifocal abscess formation and multifocal renal infarction.

Preterm delivery is the leading cause of infant morbidity and mortality, despite the fact that pyelonephritis usually necessitates hospitalisation and can progress to serious complications such as sepsis and respiratory difficulties. As a result, most clinical practise guidelines urge ASB screening and antibiotic therapy during pregnancy.A screening programme for ASB in pregnancy has long been part of regular maternal care in most health-care settings.

Complications:-

UTI has been related to an increased risk of maternal and newborn problems during pregnancy,[95] and the complications are more severe in women who have chronic inflammatory diseases, urinary tract abnormalities, autoimmune disorders, and other chronic illnesses.[96] Untreated urinary tract infection has been linked to a variety of problems, including early rupture of membranes, low birth weight, preterm birth, foetal intrauterine growth restriction, and postpartum endometritis.[97] Furthermore, earlier investigations shown that 30–50% of pregnant women with proven pyelonephritis gave delivery prematurely.[98]

Major pregnancy-related problems, such as UTI, are estimated to account for 75 percent of maternal fatalities worldwide, according to the WHO, and many of these are preventable.[99] In low- and middle-income countries (LMIC), UTI and related consequences are more common. This could be due to a lack of funds and logistics for prompt infection screening of women. At the same time, it is a less-emphasized feature in this region when it comes to pregnancy-related morbidity, mortality, and negative pregnancy outcomes. There was no information in Ethiopia about the impact of asymptomatic bacteriuria on women's health problems and poor pregnancy outcomes.[100]

However, according to the Ethiopian micro demographic health survey 2019 and other review articles, infant mortality in 2005 was assessed at 77 deaths per 1,000 live births, which was reduced to 43 deaths per 1,000 live births in 2019.[101] Furthermore, between 2005 and 2016, newborn mortality fell from 39 to 29 fatalities per 1000 live births, and has been stable since then.

Furthermore, according to an assessment of the most common risk factors for poor pregnancy outcomes, the average birth weight of babies delivered between 1990 and 2017 ranges from 2.077 to 3.147 kg. Another analysis of the literature found that the combined frequency of preterm birth in Ethiopia was 13.32 percent.[102] This demonstrates that negative pregnancy outcomes and maternal complications are remain serious health risks, even if they have been falling in recent years.

Pre-eclampsia is a type of pre-eclampsia that affects about 5% to 7% of pregnant women. This is a major cause of illness and mortality in both the mother and the foetus. Pre-eclampsia is defined as a blood pressure of greater than 140/90 mmHg after the 20th week of pregnancy with proteinuria of equal to or greater than 300 mg per 24 hours, which can damage all body systems.

Pre-eclampsia predisposes the woman to a high-risk pregnancy by influencing all of her physiological systems, and it can lead to dangerous outcomes for both the mother and her foetus.[103] Despite substantial research into the aetiology of pre-eclampsia and its high mortality rate, no whole mechanism of endothelial dysfunction and pre-eclampsia has been identified. Clinical signs to predict and prevent the onset of pre-eclampsia are still being researched.[104]

Screening and Diagnosis:

Clinical History:

The medical history is mostly used to make a clinical diagnosis of a urinary tract infection. Specific information can either enhance or decrease the likelihood of a urinary tract infection. Clinical research have established the following criteria[105,106].

- Dysuria, pollakisuria, nycturia (↑)
- Present or increased incontinence (↑)
- Macrohematuria (↑)
- Suprapubic pain (↑)
- "Offensive" smell, turbid urine (↑)
- Prior infections of the urinary tract (↑)
- Changed or new discharge, vaginal irritation (↓).

In addition, risk factors are known which increase the probability of UTI. These include:

- Sexual intercourse within the preceding two weeks
- Contraception with a vaginal diaphragm or spermicide[107]
- Contraception with DMPA (depot medroxyprogesterone acetate)
- Antibiotic administration within the preceding two to four weeks[108]
- Special anatomical features or restrictions (for example, from vesicoureteral reflux, neuropathicbladder, mechanical or functional obstruction)
- Diabetes mellitus.

Urine testing:

Urine testing is the second important element in diagnostic testing.

Urine collection :

The importance of collecting midstream urine and cleansing the perineum and vulva has been the subject of several research.[110] However, because the women in these studies were generally young and otherwise healthy, it's unclear whether they can be applied in everyday clinical practise. Making the manner of urine collection depends on the clinical situation would be a practical approach.

Fresh spontaneous urine can be used instead of midstream urine for an initial urine inquiry using a dip stick, and the genitals do not need to be cleaned. Additional investigations including urine culture, on the other hand, necessitate that the urine sample be collected and processed with as little contamination as possible.

Practical test methods:

A bacteriological urine culture including pathogen identification, quantification, and sensitivity testing is the gold standard for a urine test. In order to determine whether a patient has a UTI, orienting indirect approaches are frequently employed in practise to detect bacteria or inflammation (dip sticks). Urine microscopy and immersion culture media can be used to determine the bacterial count.

Dip sticks-

If there is clinical evidence that a patient has a UTI, urine dip sticks are one of the most commonly utilised devices for diagnostic testing. The most common test is Multistix, which may detect nitrite (a metabolic result of common urinary tract infections), leukocyte esterase, protein, and blood (as a marker of inflammation). The likelihood of a urinary tract infection increases when nitrite is discovered, with a likelihood ratio [LR] of 2.6 to 10.6. The sensitivity, on the other hand, is quite low.

The presence of leukocyte esterase, on the other hand, raises the probability to a smaller extent (LR 1.0 to 2.6). Although the detection of blood is quite sensitive, the specificity is limited. The significance of protein detection in confirming UTI varies depending on the study.

Urine microscopy-

The sensitivity of detecting UTI with 105 cfu/mL by gramme stained microscopy is limited due to methodological limitations. According to certain research, skilled personnel can obtain greater diagnostic precision than urine culture. However, the available microscopy investigations are diverse, and all review publications indicate that making broad statements is difficult.[111]

Immersion culture media-

A plastic rod coated with culture medium—mostly a combination of CLED and MacConkey agar—is used in these immersion studies. They need to be cultured for 24 hours. The sensitivity and specificity levels acquired in the laboratory cannot be replicated in primary care settings.[112] The sensitivity was determined to be 73 percent (95 percent confidence interval [CI] 66–80) and the specificity to be 94 percent (CI 88–98) in the primary care environment. If a female patient has previously had a negative nitrite test, the sensitivity drops to 65 percent (CI 55–74), but the specificity remains about the same (CI 90–99). This method does not allow for the accurate detection of 104 cfu/mL. [113]

Kerure et al. looked at 300 pregnant women to see if they had asymptomatic bacteriuria during pregnancy. Significant bacteriuria was discovered in 11% of them. They concluded that urine culture was the most sensitive test for detecting asymptomatic bacteriuria and that all pregnant women should be screened for asymptomatic bacteriuria at their first antenatal appointment.[128]

In a study of 400 pregnant women with a gestational age of less than 28 weeks, Radha et al discovered that 8.25 percent of them had asymptomatic bacteriuria. In comparison to women who did not have significant bacteriuria, they found that maternal morbidity was 24.2 percent and foetal morbidity was 24 percent in women with asymptomatic bacteriuria. They suggested that all pregnant women be screened for asymptomatic bacteriuria in the first trimester.[130]

Mukherjee et al. conducted a cross-sectional investigation on 250 pregnant women, finding that 8.4% of them had asymptomatic bacteriuria. Gram staining of uncentrifuged urine was proven to be a helpful test. The sensitivity of the leukocyte esterase and nitrite tests alone was 71.42 percent, but combined testing with either test positive had a sensitivity of 90.47 percent and a negative predictive value of 99.09 percent, suggesting that urine culture may not be necessary for all pregnant women.[131]

In a study of 350 pregnant women, Acharya et al discovered that 9.14 percent of them had asymptomatic bacteriuria. They recommended utilising urine culture to test for asymptomatic bacteriuria in all three trimesters of pregnancy and treating urine culture positive cases with susceptible antibiotics to avoid maternal and foetal problems.[132]

Females and pregnant women are more likely to have asymptomatic bacteriuria. It can lead to symptomatic urinary tract infections and pyelonephritis if left untreated. Pyelonephritis has a negative impact on both the mother and the foetus. Early detection and treatment of asymptomatic bacteriuria can help to avoid negative outcomes, which can be achieved by screening all prenatal patients for asymptomatic bacteriuria as soon as possible. The gold standard diagnostic test for detecting bacteriuria has traditionally been urine culture. Antibiotic medication tailored to the sensitivity pattern can help avoid the development of antibiotic resistance.

Treatment:-

Women who have asymptomatic bacteriuria during pregnancy are more likely to have premature or low-birth-weight babies, and they have a 20- to 30-fold greater chance of developing pyelonephritis during pregnancy.[116] According to a Cochrane comprehensive analysis, treating asymptomatic bacteriuria in pregnancy reduces the incidence of future pyelonephritis from 20 to 35 percent to 1 to 4 percent.[117] Antimicrobial treatment of asymptomatic bacteriuria also improves foetal outcomes, with lower rates of low-birth-weight babies and premature birth.[118]

Early studies usually continued antimicrobial therapy for the duration of pregnancy; however, more recent studies found that patients treated for 14 days with nitrofurantoin or trimethoprim/sulfamethoxazole (TMP/SMX; Bactrim, Septra) had similar benefits to those treated for the duration of pregnancy with continuous antimicrobial therapy.[119] Pregnant women with asymptomatic bacteriuria should get antibiotic therapy for three to seven days, according to the IDSA. There is insufficient evidence to establish if a single dose regimen is as effective as longer-term therapies, according to a Cochrane systematic review.[120]

Because the sensitivity of leukocyte esterase and nitrite tests for detecting bacteriuria in pregnant women is low, urine cultures should be used to screen these patients; however, the ideal frequency of urine culture screening has yet to be determined. Based on clinical outcomes and cost-effectiveness, a single urine culture towards the end of the first trimester is usually advised.[121] During pregnancy, women with asymptomatic bacteriuria or symptomatic UTI should be treated and should be screened on a regular basis for the length of their pregnancy. The IDSA makes no recommendations for follow-up screening of pregnant women who were found to have no asymptomatic bacteriuria at the initial screening.

Imade PE et al did a study on Asymptomatic bacteriuria among pregnant women to determine the prevalence of asymptomatic bacteriuria in pregnant women attending a primary health centre in Benin City, Nigeria. He found that A total of 556 (45.3%) of the participants had substantial bacteriuria. A substantial difference in the prevalence of asymptomatic bacteriuria was found when age was considered (P 0.0001). The prevalence of asymptomatic bacteriuria did not differ significantly by trimester (P = 0.2006).

The most common organism was Escherichia coli, which was closely followed by Staphylococcus aureus. Antibiotics such as Ciprofloxacin, Ceftriaxone, and Augmentin were found to be the most efficient against urine isolates. In the population investigated, asymptomatic bacteriuria is not prevalent among prenatal patients. All prenatal patients should have a routine urine culture test to detect any infection that may be present. This step will go a long way toward minimising pregnancy-related maternal and obstetric problems.

Antimicrobials or no antimicrobials for bacteriuria in children, healthy women, elderly populations, patients with chronic indwelling or intermittent catheters, and patients with diabetes, according to prospective,

randomised studies, did not give any benefits. Antimicrobials, on the other hand, raised the incidence of antimicrobial resistance and Clostridioides difficile infection (CDI), as well as, in certain cases, urinary tract infection (UTI) quickly after medication.[122]

Despite intensive antimicrobial use, a sterile urine cannot be maintained in some populations with a high prevalence of ASB, such as patients with chronic indwelling catheters,[123] older institutionalised populations, patients with spinal cord injury (SCI), and some diabetics.[122] The Infectious Diseases Society of America (IDSA) guidelines for adults, published in 2005, evaluated the evidence and gave recommendations for ASB treatment or nontreatment in relevant populations.

Treatment of ASB has been highlighted by antimicrobial stewardship programmes as a significant contributor to inappropriate antimicrobial usage, which causes resistance. Regardless of symptoms, a positive urine culture often supports antibiotic usage. As a result, acquiring urine cultures when they are not clinically warranted, such as for regular screening, encourages unnecessary antibiotic usage.[124]

Because of the potential societal consequences of antimicrobial resistance, the guideline committee believes that screening for bacteriuria and treating ASB should be avoided unless there is data to indicate a benefit of therapy for a

specific population. This advice is best applicable to people who place a high value on addressing the problem of rising antimicrobial resistance and other antibiotic-related problems, while placing a lower value on extremely tiny or unclear individual benefits.

An update of a 2015 Cochrane review compared antibiotic treatment with no treatment or placebo among pregnant women with asymptomatic bacteriuria provided linked information on screening effectiveness. There were 15 studies that were eligible in total, including one that was discovered during the search update. RCTs accounted for 11 of the research, whereas nonrandomized controlled clinical trials accounted for four. All except one, in Jamaica20, were carried out in high-income nations such as the United States,[125] United Kingdom, Ireland, Australia, Denmar, and the Netherlands.[126] Testing techniques (e.g., timing of pregnancy, number of confirmatory urine samples), treatment (e.g., dose, type of antibiotic), and follow-up durations differed between studies.

A meta-analysis of 12 studies (n = 2017) found low-quality evidence for a statistically and clinically significant reduction in the rate of pyelonephritis among pregnant women with silent bacteriuria who were treated versus those who were not treated. In women with asymptomatic bacteriuria who were treated, the ARR was 176 fewer occurrences of pyelonephritis per 1000 (ARR 17.6%, 95 percent CI

137 less to 202 fewer, number needed to treat 6). 12 There was also low-quality evidence indicating a statistically significant reduction of 44 low-birth-weight children per 1000 women with asymptomatic bacteriuria who were treated (ARR 4.4 percent, 95 percent CI 12 fewer to 65 fewer) across seven studies (n = 1522).

Soliman AA et al did a prospective study on Assessment and Management of Asymptomatic Bacteriuria in Pregnancy to assess the incidence, causative organisms, and response to medication and follow-up for recurrence of asymptomatic bacteriuria in pregnant and non-pregnant women in a randomized pattern with maximum safety procedures to both mother and fetus.

Soliman AA et al found that Significant bacteriuria was found in 14 cases of 100 pregnant women and 6 cases of 50 non-pregnant women, yielding a prevalence rate of 14 percent and 12 percent in both groups, respectively. Escherichia coli was the most common bacteria among the isolates (71.4 percent) and (83 percent) among infected pregnant and non-pregnant cases, respectively, followed by Klebsiella (21.4 percent) and (17 percent) in both groups, and staph aureus (7.2 percent) among solely infected pregnant cases.

The isolates' antibiotic susceptibility profiles were determined. The antibiotics amoxicillin/clavulanic acid, cephalexin, nitrofurantoin, and sulphanamides have the highest sensitivity to the isolated organisms during pregnancy (80%), followed by cephalexin, nitrofurantoin, and sulphanamides. The antibiotic susceptibility of isolates in non-pregnant women, on the other hand, revealed that amikin and meropenem had the highest sensitivity to the isolates (100%), followed by amoxicillin/clavulanic acid and nitrofurantoin, with sulphanamides, levofloxacin, and ciprofloxacin having the lowest sensitivity. Urine analysis, urine culture, and sensitivity tests were performed before and after a 5-day course of antibiotic treatment, as well as one month later, and both groups showed no recurrence and no development of pyelonephritis (pregnant and nonpregnant women).[127]

ANTIBIOTIC REGIMENS FOR MANAGEMENT OF ASB DURING ANTENATAL PERIOD:

S.no	Antibiotic	Drug category in pregnancy	Dosage
1	Cephalexin	B	250 mg 2-4 times daily
2	Erythromycin	B	250-500 mg 4 times daily
3	Nitrofurantoin	B	50-100mg 4 times daily
4	Sulfisoxazole *	C	1g qid
5	Amoxicillin- clavulanic acid	B	250 mg qid
6	Fosfomycin	B	One 3 g pack
7	Trimethoprim-Sulfamethoxazole #	C	160/180 mg bd

* Not to be used at term

#not to be used in 1st trimester & term

ADVANTAGES AND DISADVANTAGES OF VARIOUS ANTIBIOTICS USED TO TREAT UTI:

S. No.	Commonly used Antibiotics In pregnancy	Advantages	Disadvantages
1	AMPICILLIN	No teratogenic effects	1)high resistance rates 2)sometimes associated with allergic and anaphylactic reactions
2	CEPHALEXIN	No teratogenic effects	1)ineffective against Enterococcus species 2)sometimes associated with allergic &anaphylactic reactions
3	NITROFURANTOIN	1)safe in all trimesters 2)low level of resistance among uropathogens	1)achieves therapaeutic levels only in the urine, so it cannot be used to treat pyelonephritis 2) ineffective against proteus spp. 3)Haemolytic anaemia in G6PD deficient cases

4	COTRIMOXAZOLE		1)neural tube defects if used in 1st trimester 2) contraindicated after 32 wks since it causes jaundice & hemolytic anemia in G6PD deficient babies
5	FOSFOMYCIN	1)single dose is as effective as multiple doses of other antibiotics 2)low incidence of resistance	needs more evidence for use in pregnancy

NON PHARMACOLOGICAL TREATMENT OF UTI:

1. Ample consumption of fluids
2. Emptying the bladder after intercourse
3. Cranberry juice
4. Yoghurt-has lactobacillus

Materials and Methods:-

Study design:

This was a Hospital based Prospective analytical observational study

Study setting:

The present study was carried out in the Department of Obstetrics and Gynecology at Government Mohan kumaramangalam Medical College and Hospital, Salem.

Study period:

This study was conducted during the period of January 2020 to December 2021 for almost for the period of two years.

Sample size:

150 cases were recruited in the study based on the previous year case load and feasibility.

Study population:

Patients admitted in Antenatal ward & Labour ward with the following inclusion and exclusion criteria's.

Inclusion criteria –

- All patients with gestational age between 12 - 16 weeks.
- Patients giving informed consent.
- With no signs and symptoms of urinary tract infections.
- Any parity
- Singleton pregnancies

Exclusion criteria –

- Gestational age of more than 16 weeks.
- Patients not giving informed consent.
- With signs and symptoms of urinary tract infections
- On antibiotics for other medical illness

Study procedure and data collection:

After obtaining the informed oral and written consent in their local language. Patients who were not willing to participate in the study were excluded. Apart from the routine investigations taken during the first visit, a midstream clean catch early morning sample was collected from each of them. The method to reduce the chances of contamination was explained to them. The sample was collected in sterile containers and sent for processing immediately or within two hours of collection.

In Pre deisgned and Pre tested questionnaire, that contains details such as Socio demographic details, Patient history Routine Investigations, including urine culture sensitivity and urine routine tests, General examination, Vitals monitoring, Obstetric examination, Expert USG, Perinatal follow up of newborn such as APGAR, Admission to NICU and Morbidity.

Statistical Analysis:

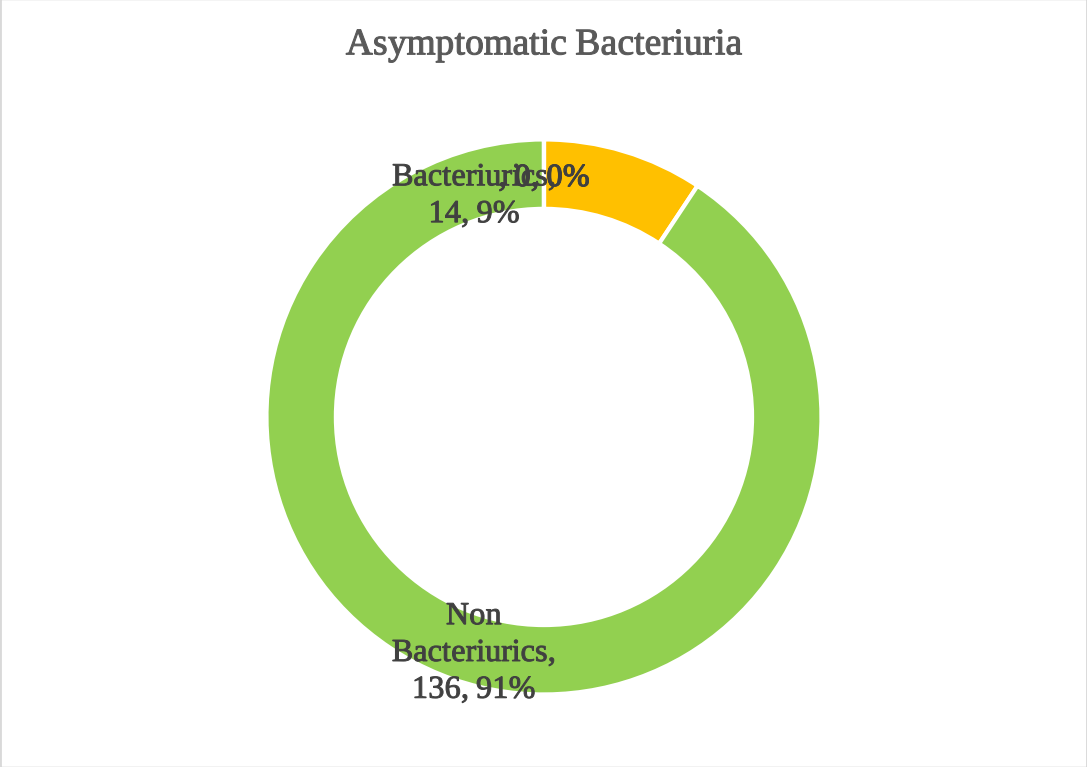
Data was entered in Ms excel and imported into SPSS 18 Software package. Descriptive statistics like mean, standard deviations and percentage proportions were used to describe baseline study participant parameters. Parametric tests were used to analyse the parametric data if it passed the tests of normality; if it failed then non-parametric tests were used for analysis. Chi-square test was used to analyse categorical data.

Ethics:

This study was conducted after obtaining the Intuitional Ethics and Research Committee approval.

Results:

Table 1: Incidence of Asymptomatic Bacteriuria		
	Frequencies	**Percentage**
Positive (bacteriurics)	14	9.3%
Negative (non bacteriurics)	136	90.7%



From the above table, the incidence of asymptomatic bacteriuria is explained, out of 150 pregnant women asymptomatic bacteriuria was observed to be present in 9.3% of pregnant women during their prenatal check-ups.

Table 2: Age group Wise distribution			
Age groups	Total Cases	Bacteriurics	Percentage
15-20 years of age	30	6	20%
21- 30years of age	81	7	8.6%
31-40 years of age	39	1	2.5%

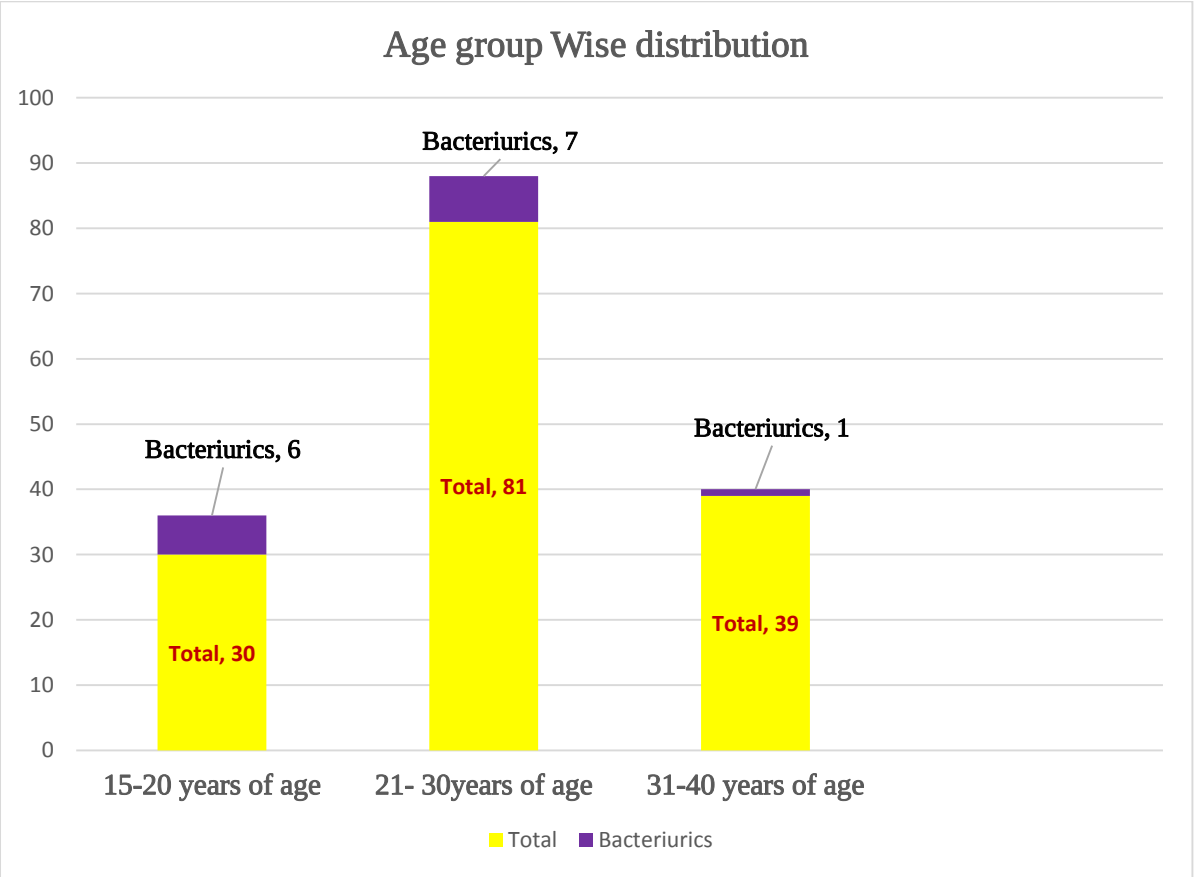
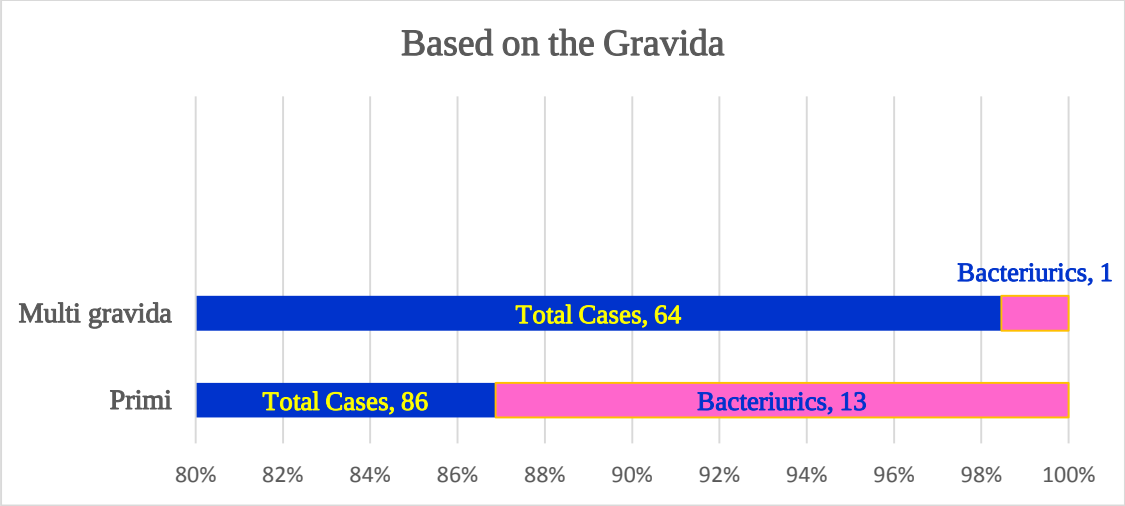


Table 2, shows the age group wise distribution, in the age group of 15-20 years of age 30 pregnant women were present in that 6 (20%) were Bacteriurics. In the age group of 21-30 years of age 81 pregnant women were present in that 7 (8.6%) were Bacteriurics. Regarding the age group of 31-40 years of age 39 pregnant women were present in that 1 (2.5%) were Bacteriurics. The incidence is higher in the 16-20 year old age group, which may be associated to peak sexual activity in this age cohort, although it is not statistically significant (P=0.5325).

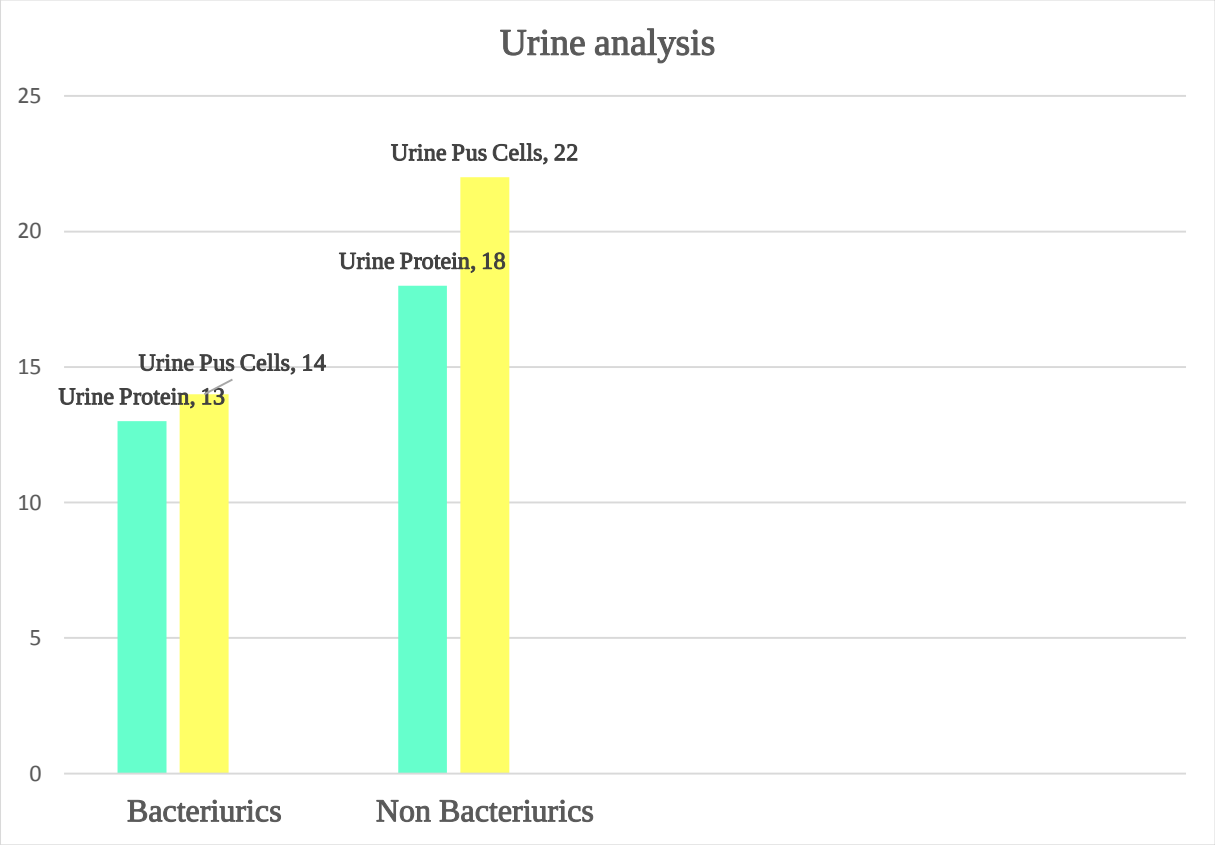
Table 3: Distribution based on the Gravida			
Obstetric score	**Total Cases**	**Bacteriurics**	**Percentage**
Primi	86	13	15.11 %
Multi gravida	64	1	1.54 %



As seen above, distribution based on the gravida was described, out of 150 pregnant women 86 were Primi and 64 were Multi gravida. In that 64 Primi, about 13 (15.11%) were Bacteriurics and among 64 Multi gravida only 1 Bacteriurics were done with the p value 0.0046.

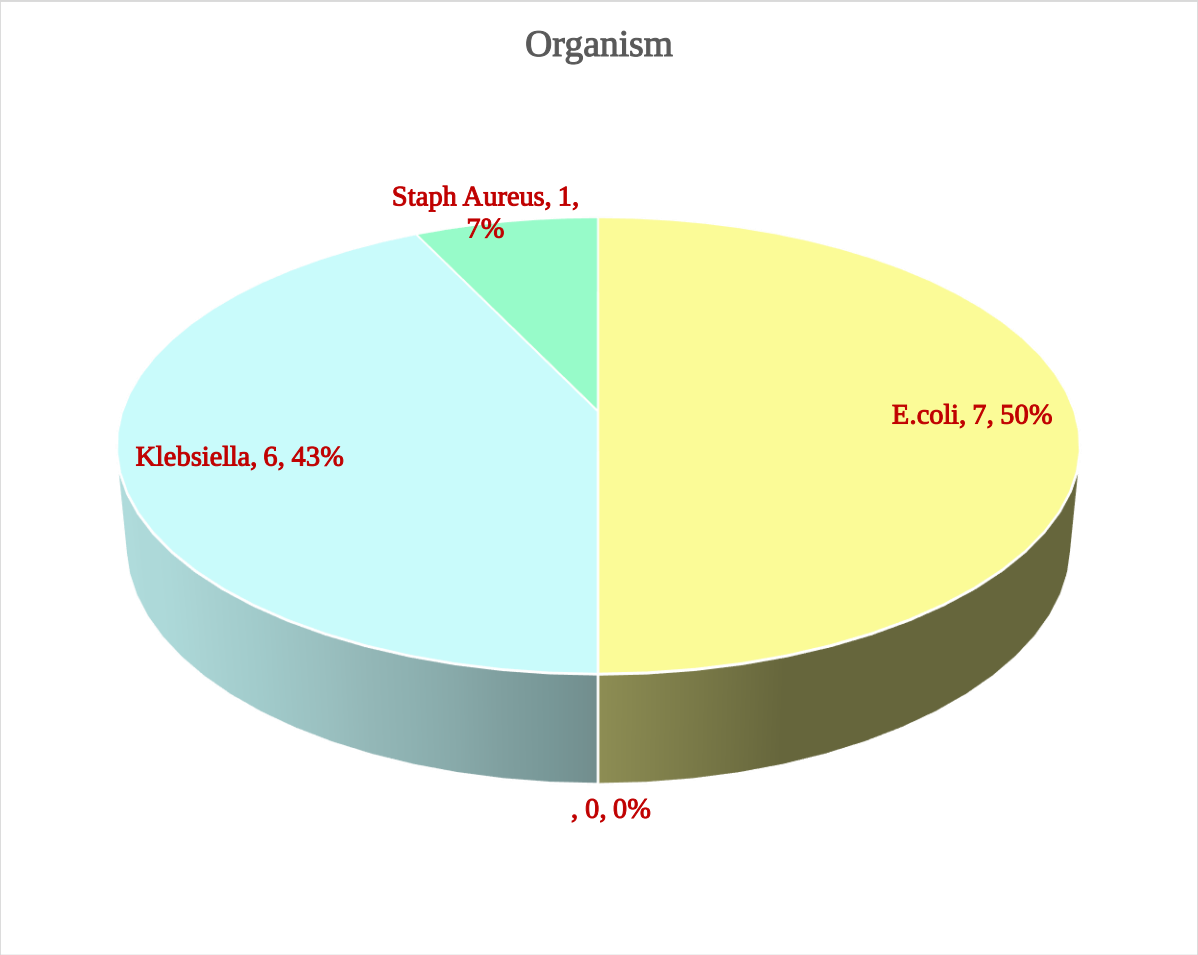
More number of cases seen in Primi which is statistically significant compared to Multi gravida.

Table 4: Frequencies of Urine analysis					
Status	Urine Protein		Urine Pus Cells		P value
	Positive	Percentage	Positive	Percentage	
Bacteriurics n = 14	13	92.8%	14	100%	0.0642
Non Bacteriurics N=136	18	13.2%	22	16.1%	



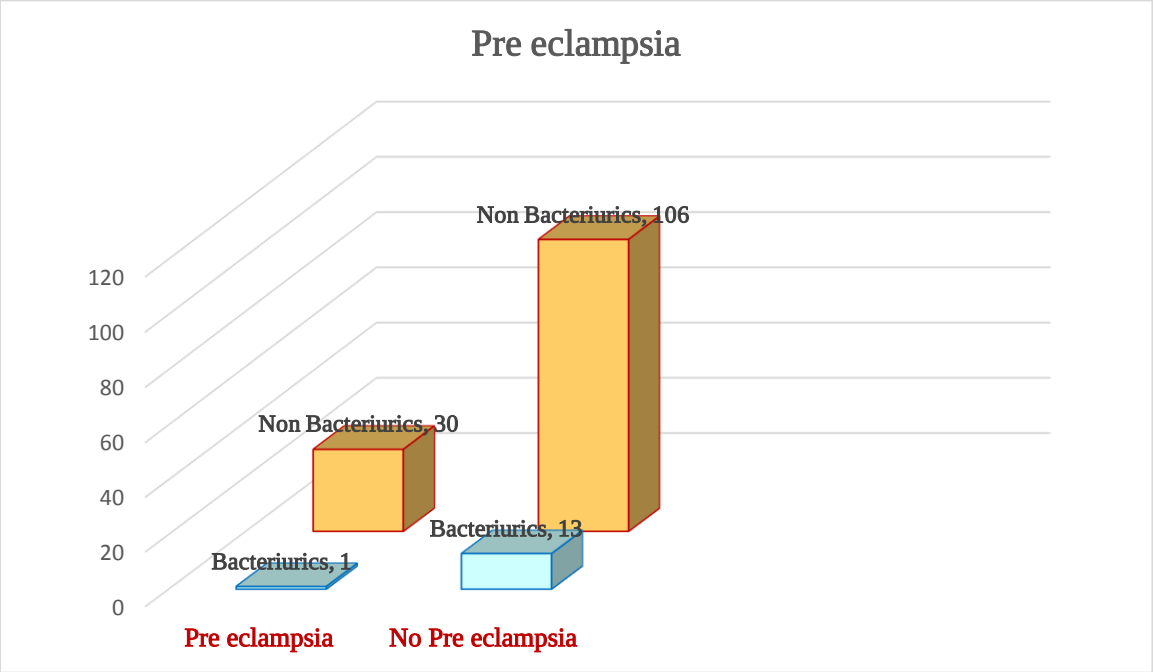
The frequencies and percentages of the urine analysis was, out of 14 Bacteriurics 13 (92.8%) were positive to urine protein and 14 (100%) were positive to urine pus cells. From the 136 Non Bacteriurics 18 (13.2%) pregnant women were positive to Urine protein and 22 (16.1%) were positive to Urine pus cells with P value 0.0642. Both Proteinuria and Pyuria are statistically insignificant with the bacteriuria.

Table 5: Descriptive frequencies of Organism			
Organism	**Frequency**	**Percentage**	**P value**
E.coli	7	50%	0.467
Klebsiella	6	42.8%	
Staph Aureus	1	7.2%	



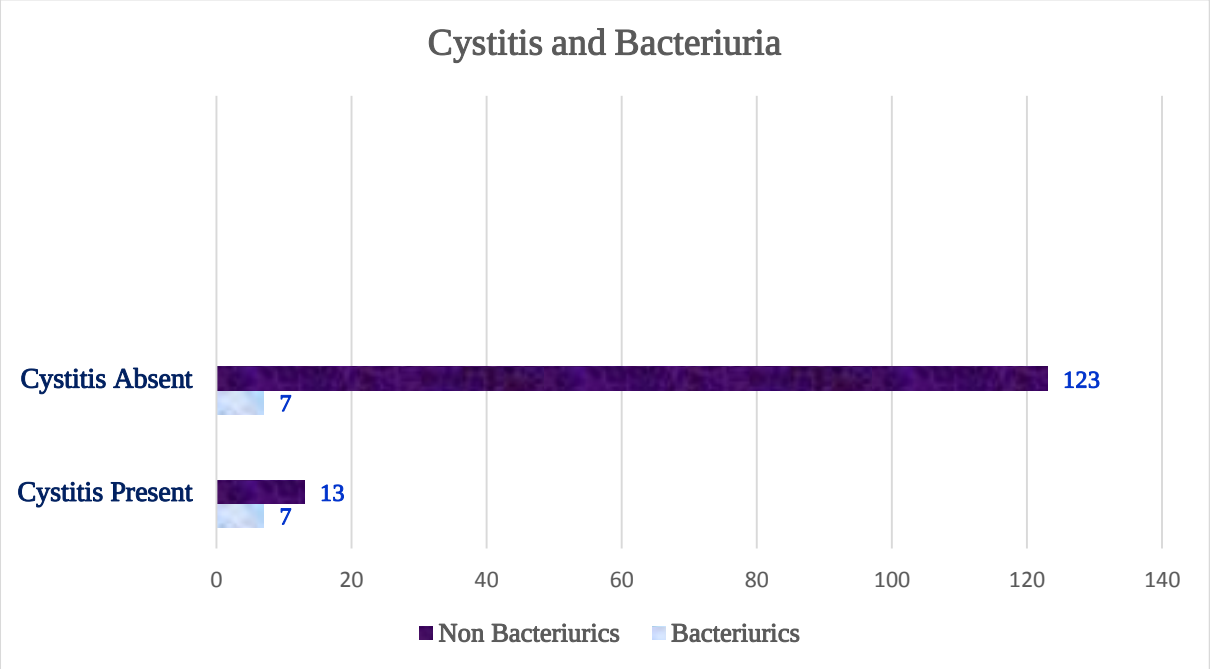
The descriptive frequencies for the organism from the urine culture among the 14 bacteriuria pregnant women were, 7 (50%) was reported with E.Coli as most common organism, followed by Klebsiella with 6 (42.8%) cases and in only one (7.2%) case with Staph Aureus. The difference among them with bacteriuria was insignificant with the p value 0.467. These are collectively called as Uropathogens.

Table 6 : Association between Pre eclampsia and Bacteriuria			
	Bacteriurics N=14	Non Bacteriurics N= 136	P value
Pre eclampsia	1 (7.1%)	30 (22%)	0.2012
No Pre eclampsia	13 (92.8%)	106 (78%)	



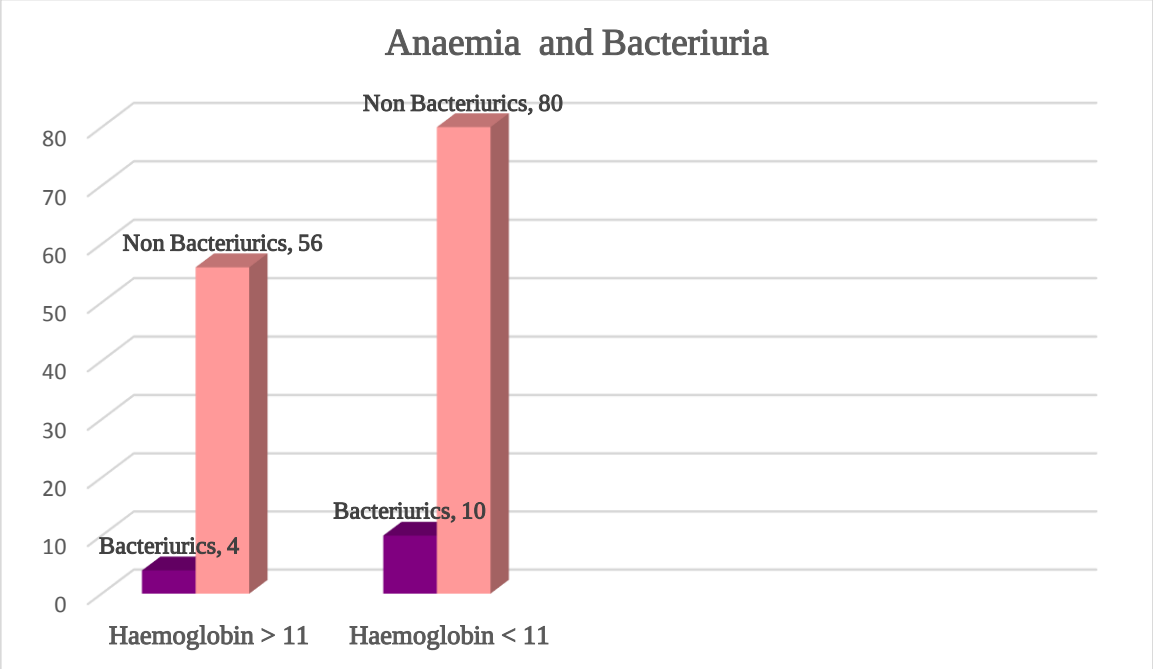
The association of Pre eclampsia with Bacteriurics and Non Bacteriurics were, among 14 bacteriuria pregnant women only one (7.1%) had pre eclampsia and the remaining 13 (92.8%) had no pre eclampsia. Out of 136 Non bacteriuric pregnant women 30 (22%) had pre eclampsia and 106 (78%) had no pre eclampsia and this difference was not statistically significant with the p value 0.2012.

Table 7 : Correlation between Cystitis and Bacteriuria			
Cystitis	**Bacteriurics N=14**	**Non Bacteriurics N= 136**	**P value**
Present	7 (50%)	13 (9.5%)	0.0001
Absent	7 (50%)	123 (90.5%)	



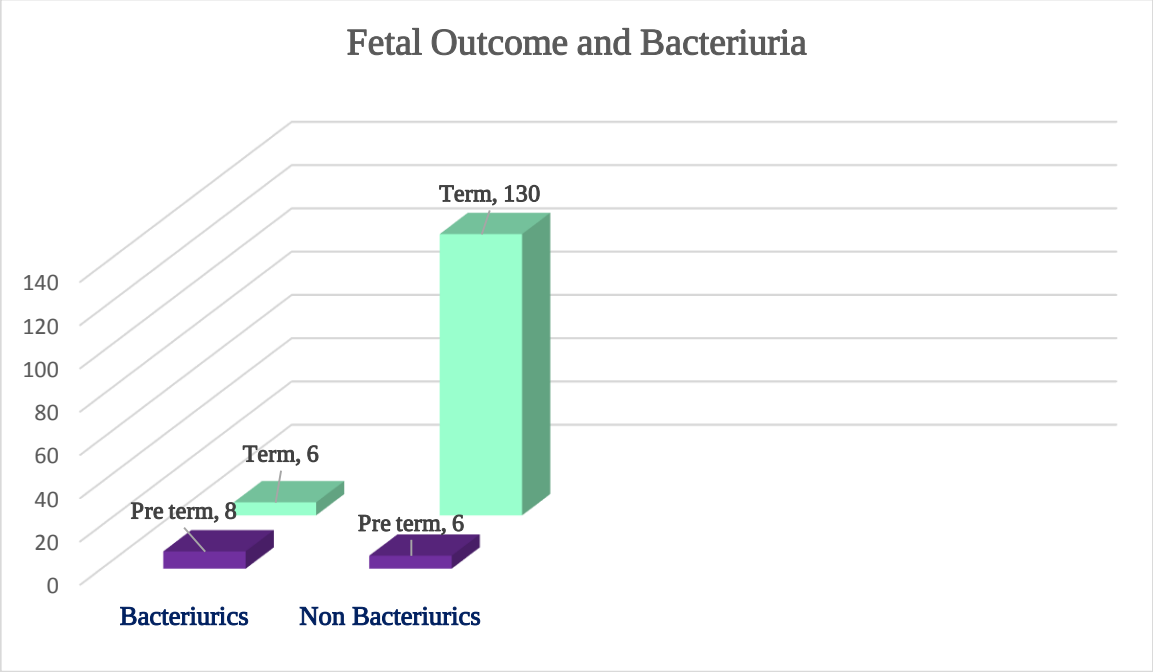
The Correlation of Cystitis with Bacteriurics and Non Bacteriurics were, among 14 bacteriuria pregnant women 7 (50%) had cystitis and the other half 7 (50%) had no cystitis. Out of 136 Non bacteriuric pregnant women 13 (9.5%) had cystitis and 123 (90.5%) had no cystitis and this difference was statistically very significant with the p value less than 0.0001.

Table 8: Association between Anaemia and Bacteriuria			
	Bacteriurics N=14	Non Bacteriurics N= 136	P value
Haemoglobin ≥ 11	4 (28.5%)	56 (41.1%)	0.1904
Haemoglobin < 11 (Anaemic)	10 (71.4%)	80 (58.8%)	



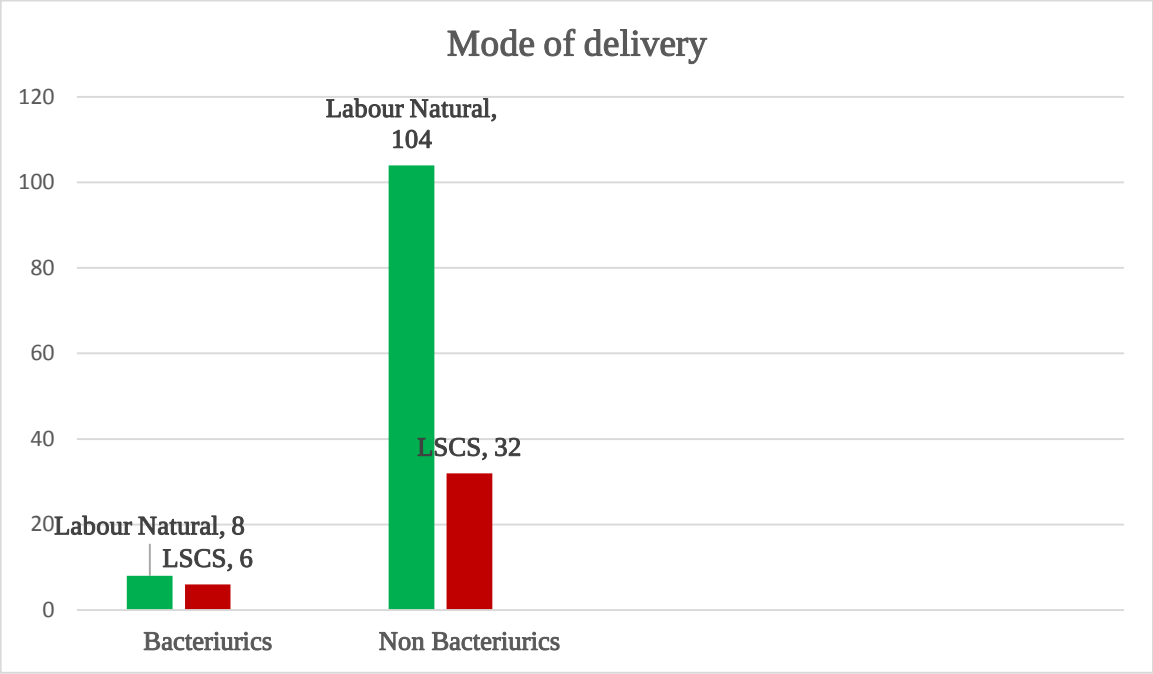
The Association of Anaemia with Bacteriurics and Non Bacteriurics were, among 14 bacteriuria pregnant women 4 (28.5%) had Haemoglobin > 11 and the remaining 10 (71.4%) majority of the pregnant women had Haemoglobin < 11 which is classified as anaemia based on WHO classification. Out of 136 Non bacteriuric pregnant women 56 (41.1%) were Normal and had Haemoglobin > 11 and 80 (58.8%) had Haemoglobin < 11 (Anaemic) and this association was statistically insignificant with the p value less than 0.1904.

Table 9: Relation between Fetal Outcome and Bacteriuria			
	Bacteriurics N=14	Non Bacteriurics N= 136	P value
Pre term	8 (57.1%)	6 (4.4%)	0.0001
Term	6 (42.8%)	130 (95.5%)	



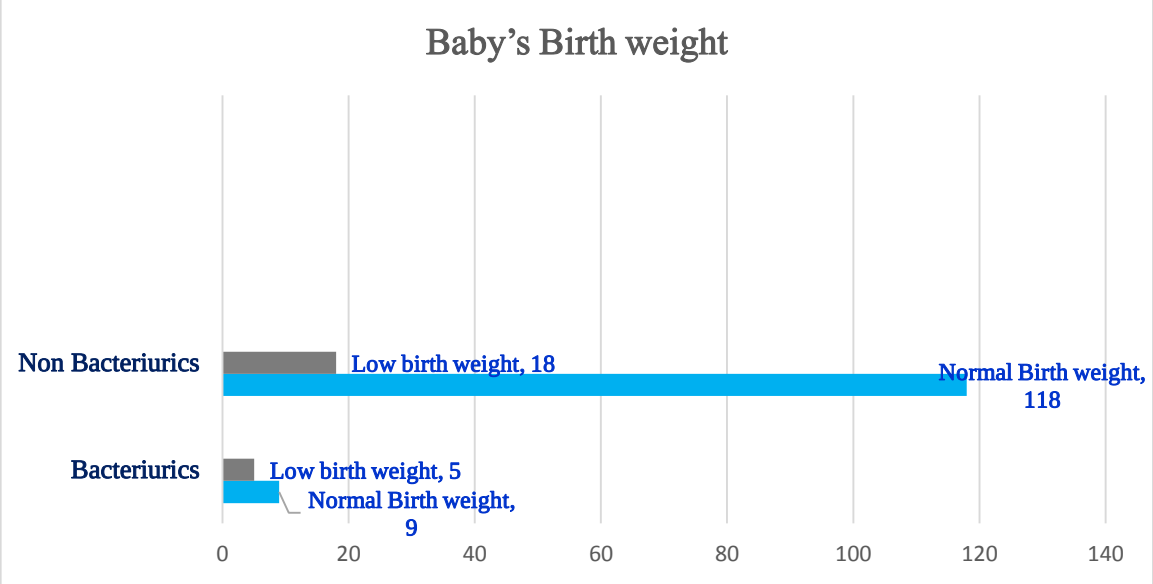
The relation of fetal outcome with Bacteriurics and Non Bacteriurics were, among 14 bacteriuria pregnant women 8 (57.1%) had Pre term delivery and the other 6 (42.8%) pregnant women had term delivery. Out of 136 Non bacteriuric pregnant women 6 (4.4%) had pre term and 130 (95.5%) had term and this association was statistically very significant with the p value less than 0.0001.

Table 10: Association between Mode of delivery and Bacteriuria N=100			
Mode	**Bacteriurics**	**Non Bacteriurics**	**P value**
Labour Natural	8 (57.1%)	104 (76.4%)	0.0114
LSCS	6 (42.8%)	32 (23.5%)	



The association of Mode of delivery with Bacteriurics and Non Bacteriurics were, among 14 bacteriuria pregnant women 8 (57.1%) had Labour Natural and the remaining 6 (42.8%) pregnant women had Lower segment Caesarean section. Out of 136 Non bacteriuric pregnant women 104 (76.4%) had Normal Natural and 32 (23.5%) had Lower segment Caesarean section and this association was statistically very significant with the p value less than 0.0114.

Table 11 : Correlation between baby's Birth weight and Bacteriuria			
	Bacteriurics N=14	Non Bacteriurics N= 136	P value
Normal Birth weight	9 (64.2%)	118 (86.7%)	0.0131
Low birth weight	5 (35.7%)	18 (13.2%)	



The Correlation of baby's birth weight with Bacteriurics and Non Bacteriurics were, among 14 bacteriuria pregnant women 9 (64.2%) had birth weight in normal range above 2.5 kgs and the remaining 5 (35.7%) pregnant women had babies with low birth weight less than 2.5kg. Out of 136 Non bacteriuric pregnant women 118 (86.7%) had Normal birth weight and 18 (13.2%) had Low birth weight babies and this association was statistically very significant with the p value less than 0.0131.

Table 12: Antibiogram					
	Cipro	Norf	Cefi	Gara	Ampi
E.coli (7)	100%	100%	100%	100%	71.4%
Klebsiella (6)	100%	100%	100%	100%	85.7%
Staph Aureus (1)	100%	100%	100%	-	-

As seen above the antibiogram was described for the uropathogens. Historically, ampicillin was the drug of choice, but E.coli has developed resistance to it in recent years. The sensitivity of E.coli to ampicillin was found to be 71% in this investigation.

Discussion:

From this present study, the incidence of asymptomatic bacteriuria was 9.3%. It agrees with other recent research that have found a prevalence range of 2-10 percent.[128]. If the prevalence of asymptomatic bacteriuria is more than 2% in a given area, an American cost evaluation study recommends screening all pregnant women. The current study coincides with the findings of Maryam Kasraeian et al, Vaishali et al, and Ansari HQ et al among pregnant women.[136]

In this currents study, more number of cases seen in Primi which is statistically significant compared to Multi gravida. In this study, no substantial differences in the occurrence of asymptomatic bacteriuria were found between gravid and parity status of pregnant women.

In this study, the age group wise distribution, in the age group of 15-20 years of age was 20%. In the age group of 21-30 years of age 8.6% were Bacteriurics. Regarding the age group of 31-40 years of age 2.5% Bacteriurics. This is consistent with other studies that found no link between age and risk [134]. While some research found that the younger age groups had the highest incidence, others found that the older age groups had the lowest prevalence. Early marriage and childbearing in our country, particularly in the rural sector, are to blame for the high

incidence of ASB in the reproductive age group. Many studies demonstrate that getting older is a risk factor for getting ASB in pregnancy because the ageing process causes a drop in glycogen deposition and a loss in lactobacillus, which increases bacterial adhesion and invasion by infections, making them more susceptible.[137]

In our study 50% was reported with E.Coli as most common organism, followed by Klebsiella with 42.8% of cases and in 7.2% case with Staph Aureus. Other authors [134,135] have made similar observations. The most common organism isolated was E. coli (64.3 percent), followed by Klebsiella spp (11.9 percent). This finding was in line with the findings of other investigations. [135]. This trend could be related to urinary stasis, which is typical during pregnancy, and because most Escherichia coli strains favour that environment, they induce UTI. Another cause could be poor genital hygiene among pregnant women, who may find it difficult to adequately clean their anus after defecating or clean their genital after releasing urine.

In our study 92.8% were positive to urine protein and 100% were positive to urine pus cells. Both Proteinuria and Pyuria are statistically insignificant with the bacteriuria. Brenner et al states that Pyuria in pregnant women, defined as more than 5-7 pus cells per high power field, is more likely to indicate a urinary tract infection than colonisation.

In this study, 28.5% had Haemoglobin > 11 and the remaining 71.4% majority of the pregnant women had Haemoglobin < 11 which is classified as anaemia based on WHO classification. These findings matched those of Tahir S et al research's Many factors other than bacteriuria related with preterm delivery and low birth weight could have influenced these outcomes, according to Smith K et al, but we were unable to investigate their impact because these data were removed from their investigation.[138]

In our study 57.1% had Pre term delivery and the other 42.8% pregnant women had term delivery. Mandell et al says that Premature birth, low birth weight, and perinatal death are all reduced when ASB is treated during pregnancy at the first prenatal appointment early in the pregnancy.

In this study 64.2% had birth weight in normal range above 2.5 kgs and the remaining 5 35.7% pregnant women had babies with low birth weight less than 2.5kg. Shabnam Tahir et al. reported similar results in their research. [139] Many research have looked into the link between asymptomatic bacteriuria and prematurity/low birth weight (LBW), but none have come to a conclusion yet. Romer R and Oyarzun E conducted a metaanalysis of the link between asymptomatic bacteriuria and preterm delivery/low birth weight to assess and combine the results of prior studies in order to reconcile the contradiction between contradicting clinical trial

outcomes. Romer R, Oyarzun E, and colleagues found a substantial link between untreated asymptomatic bacteriuria and LBW/preterm birth, and that antibiotic treatment can reduce the risk of LBW.[140]

In our study E.coli has developed resistance to it in recent years. The sensitivity of E.coli to ampicillin was found to be 71% in this investigation. Resistance to ampicillin was found in 20 – 30% of cases of E. coli infection.

Summary:-

- The incidence of asymptomatic bacteriuria was 9.3%.
- More number of cases seen in Primi which is statistically significant compared to Multi gravida.
- The younger age groups had the highest incidence Bacteriuria.
- E.Coli as most common organism among the uropathogens in culture sensitivity.
- 92.8% were positive to urine protein and 100% were positive to urine pus cells
- 71.4% majority of the pregnant women were anaemic in Bacteriuria
- 57.1% had Pre term delivery among Bacteriuria pregnant women
- 35.7% pregnant women had babies with low birth weight.
- The sensitivity of E.coli to ampicillin was found to be 71% in this investigation.

Conclusion:

Based on the above observation, the possible consequences of untreated Asymptomatic Bacteriuria in pregnant women, all pregnant women should be checked. Because of the negative impact of undiagnosed asymptomatic bacteriuria on mother and child, we recommend routine urine culture screening for all pregnant women attending prenatal clinics in order to protect mother and child from infection-related complications. As a result, antibiotic sensitivity patterns should be considered to choose therapy, as improper therapy can lead to treatment failure and recurrence, both of which can be dangerous.

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PROFORMA

Name: LMP:

Age: EDD:

OP number: GA at first visit:

Unit:

Education:

Occupation &income :

S.E status:

Chief complaints/routine ANC:

Menstrual history: RMP:

Marital history:

Obstetric code: Gravidapara live

Significant obstetric history: abortions/preterm labour/pre eclampsia

Past history: UTI/diabetes mellitus/hypertension/renal disease

Family history:Diabetes/hypertension/renal disease

General examination:

Height:

Weight:

Pallor :+/-

Blood pressure:

Obstetric examination:

EFw:

Investigations:

Urine: protein:

Sugar:

Microscopy:

Urine culture &sensitivity:

Colony count:

Hb%:

Blood sugar:

Blood urea:

Serum creatinine:

USG:

Follow up:

Date of admission:

Date of delivery:

Date of discharge:

Pregnancy outcome:Abortion/term/preterm

Complications if any:

Mode of delivery: labour natural/caesarean section/instrumental delivery

CONSENT FORM

STUDY TITLE:

"asymptomatic bacteriuria in pregnancy and its effect of screening and treatment in maternal and fetal outcome"

DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY GMKMCH -SALEM

PARTICIPANT NAME:

AGE:

SEX:

I.P. NO:

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

I have been explained about the possible complications that may occur during and after medical procedure. I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving any reason.

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

I hereby consent to participate in this study.

Time :

Patient name;

Date :

Signature / Thumb Impression of Patient:

Place

Name and signature of the Investigator

ஆராய்ச்சி ஒப்புதல் படிவம்

பெயர்: தேதி:

வயது: உள்நோயாளி எண்:

பாலினம்: ஆய்வு சேர்க்கை எண்:

இந்த ஆய்வின் நோக்கம் மற்றும் விவரங்கள் முழுமையாக எனக்கு தெளிவாக விளக்கப்பட்டது .இவ்வாய்வில் இருந்து நான் எந்த நேரமும் பின்வாங்கலாம் என்பதையும் அதனால் எனக்கு எந்த பாதிப்பும் இல்லை என்பதையும் தெளிவாக புரிந்து கொண்டேன்.

முடிவுகளை அல்லது கருத்துகளை வெளியிடும் போதோ அல்லது ஆய்வின் போதோ என்னுடைய பெயரையோ அல்லது அடையாளங்களையோ வெளியிட மாட்டார்கள் என்பதையும் அறிந்து கொண்டேன்.

இந்த ஆய்வில் எவ்வித நிர்பந்தமும் இன்றி எனது சொந்த விருப்பத்தின் பேரில் நான் பங்கு பெறுகின்றேன்.

நான் சுயநினைவுடனும் முழு சுதந்திரத்துடனும் இந்த மருத்துவ ஆராய்ச்சியில் சேர்த்துக்கொள்ள சம்மதிக்கின்றேன்.

ஆராய்சியாளர் ஒப்பம் பங்கேற்பாளர் ஒப்பம்

(அ)

இடது பெருவிரல்ரேகை

Master Chart

Serial No	Name	Age	Obstetric score	Gestational age (weeks)	Hemoglobin (g/dl)	urine albumin	urine pus cells	urine culture	urine bacterial colony count	Cystitis	preeclampsia	IUGR	Fetal outcome	Mode of delivery	Birth weight		Cipro	Norfl	Cef	gara	ampl
1	poorani	24	G2P1L1	15	9.8	nil	4-5 cells	klebshiella	1,00,000	no	no	no	Term	labour natural	2.6kg						
2	kaviya	25	Primi	16	9.6	nil	3-4 cells	-	-	no	no	no	Term	LSCS	2.5Kg						
3	priya	19	G3P1L1A1	13	10.2	nil	nil	-	-	no	no	no	Term	labour natural	3kg						
4	vasigi	22	Primi	13	10.8	1+	nil	-	-	no	yes	no	term	LSCS	3.6kg						
5	papa	25	Primi	14	11.4	nil	3-5 cells	E-coli	>1,00,000	no	no	no	Preterm	labour natural	2kg		*	*	*	*	*
6	chellathai	40	G2P1L1	13	12.4	1+	3-5cells	staph aureus	1,00,000	yes	yes	yes	preterm	labour natural	2.4kg			*	*	*	
7	kuruvamma	29	primi	11	7.4	nil	-	-	-	no	no	no	term	labour natural	2.75kg			*	*	*	
8	Divya sri	25	primi	15	6.6	nil	3-5cells	E-coli	<1, 00,000	no	yes	no	preterm	labour natural	2kg			*	*	*	
9	roshini	20	G3P2L1	16	11.4	nil	nil	-	-	no	no	no	term	labour natural	3.4kg			*	*	*	
10	bala	25	primi	13	10.6	nil	nil	-	-	no	no	no	term	labour natural	2.7kg			*	*	*	
11	chandraLeka	32	G23P2L2	14	11	nil	nil			no	no	no	term	labour natural	2.75kg			*			
12	pooja	24	primi	15	12	nil	nil	-	-	no	no	no	term	LSCS	3.2kg						
13	annalakshmi	17	primi	16	9.8	nil	nil	-	-	no	no	no	term	labour natural	2.9kg						
14	vijayaLakshmi	19	primi	15	10	+	10	klebshiella	>1,00,000	no	no	no	term	labour natural	2.5kg		*	*	*	*	
15	chellathai	33	G2P1L1	11	9.6	NIL	8	-	-	no	no	yes	Term	Labour natural	2.5kg						
16	maheshwari	30	primi	13	10.8	+	10	ecoli	>1,00,000	yes	no	yes	preterm	LSCS	2kg		*	*	*	*	*
17	keerthika	19	primi	12	10.6	nil	nil			no	no	no	term	labour natural	3kg			*	*	*	
18	iswarya	23	G2P1L1	15	12	nil	nil			no	no	no	term	labour natural	2.5kg			*	*	*	
19	meenu	35	primi	16	11	nil	nil			no	no	no	term	labour natural	2.65kg			*	*	*	
20	yuvasri	32	G3P1L1A1	14	8.5	1+	nil			no	no	no	Term	labour natural	2.5kg			*	*	*	
21	viveka	30	primi	13	11.2	nil	nil			no	no	no	Term	labour natural	2.2kg			*	*	*	
22	dharani	31	G4P2L0A1	14	14	nil	nil			no	no	no	preterm	LSCS	2.5kg						
23	roshini	25	G2P1L1	15	8.6	2+	3-5 cells			no	yes	yes	preterm	LSCS	2.5kg						
24	archana	26	primi	16	9.3	1+	5 cells			yes	yes	no	term	labour natural	2.5kg						
25	meenatchi	24	G2P1L1	15	9.8	nil	4-5 cells	klebshiella	1,00,000	no	no	no	Term	labour natural	2.6kg						
26	pavalam	25	Primi	16	9.6	nil	3-4 cells	-	-	no	no	no	Term	LSCS	2.5Kg						
27	durga sri	19	G3P1L1A1	13	10.2	nil	nil	-	-	no	no	no	Term	labour natural	3kg						
28	poongavi	22	Primi	13	10.8	1+	nil	-	-	no	yes	no	term	LSCS	3.6kg						
29	Ruby	25	Primi	14	11.4	nil	3-5 cells	E-coli	<1, 00,000	no	no	no	Preterm	labour natural	2kg						
30	priyadarshini	40	G2P1L1	13	12.4	1+	3-5cells	staph aureus	>1,00,000	yes	yes	yes	preterm	labour natural	2.5kg		*	*	*		
31	poongodi	29	primi	11	7.4	nil	-	-	-	no	no	no	term	labour natural	2.75kg						
32	abirami	25	primi	15	6.6	nil	3-5cells	E-coli	<1, 00,000	no	yes	no	preterm	labour natural	2kg						
33	lakshmi	20	G3P2L1	16	11.4	nil	nil	-	-	no	no	no	term	labour natural	3.4kg						
34	priya	25	primi	13	10.6	nil	nil	-	-	no	no	no	term	labour natural	2.7kg						
35	karthika	32	G23P2L2	14	11	nil	nil			no	no	no	term	labour natural	2.75kg						
36	kani	24	primi	15	12	nil	nil	-	-	no	no	no	term	LSCS	3.2kg						
37	jerlin	17	primi	16	9.8	nil	nil	-	-	no	no	no	term	labour natural	2.9kg						
38	praveena	19	primi	15	10	+	10	klebshiella	>1,00,000	no	no	no	term	labour natural	2.5kg		*	*	*	*	*
39	meenu	33	G2P1L1	11	9.6	NIL	8	-	-	no	no	yes	Term	Labour natural	2,5kg						
40	madhu priya	30	primi	13	10.8	+	10	ecoli	>1,00,000	yes	no	yes	preterm	LSCS	2kg		*	*	*	*	
41	nagalakshmi	19	primi	12	10.6	nil	nil			no	no	no	term	labour natural	3kg			*	*	*	
42	rubadarshini	23	G2P1L1	15	12	nil	nil			no	no	no	term	labour natural	2.5kg			*	*	*	
43	anitha	35	primi	16	11	nil	nil			no	no	no	term	labour natural	2.65kg			*	*	*	
44	bala	32	G3P1L1A1	14	8.5	1+	nil			no	no	no	Term	labour natural	2.5kg			*	*	*	
45	chandra	30	primi	13	11.2	nil	nil			no	no	no	Term	labour natural	2.2kg			*	*	*	
46	latha	31	G4P2L0A1	14	14	nil	nil			no	no	no	preterm	LSCS	2.5Kg						
47	prema	25	G2P1L1	15	8.6	2+	3-5 cells			no	yes	yes	preterm	LSCS	2.5kg						
48	yuva	26	primi	16	9.3	1+	5 cells			yes	yes	no	term	labour natural	2.5kg						
49	dharani	24	G2P1L1	15	9.8	nil	4-5 cells	klebshiella	1,00,000	no	no	no	Term	labour natural	2.6kg						
50	bhavana	25	Primi	16	9.6	nil	3-4 cells	-	-	no	no	no	Term	LSCS	2.5Kg						
51	priyanka sri	19	G3P1L1A1	13	10.2	nil	nil	-	-	no	no	no	Term	labour natural	3kg						
52	prema	22	Primi	13	10.8	1+	nil	-	-	no	yes	no	term	LSCS	3.6kg						
53	sivani	25	Primi	14	11.4	nil	3-5 cells	E-coli	<1, 00,000	no	no	no	Preterm	labour natural	2kg						
54	madhu	40	G2P1L1	13	12.4	1+	3-5cells	staph aureus	1,00,000	yes	yes	yes	preterm	labour natural	2.5kg						
55	Priya	29	primi	11	7.4	nil	-	-	-	no	no	no	term	labour natural	2.75kg						
56	divya	25	primi	15	6.6	nil	3-5cells	E-coli	<1, 00,000	no	yes	no	preterm	labour natural	2kg						
57	jothi	20	G3P2L1	16	11.4	nil	nil	-	-	no	no	no	term	labour natural	3.4kg						
58	keerthika	25	primi	13	10.6	nil	nil	-	-	no	no	no	term	labour natural	2.7kg						
59	iswarya	32	G23P2L2	14	11	nil	nil			no	no	no	term	labour natural	2.75kg						
60	supriya	24	primi	15	12	nil	nil	-	-	no	no	no	term	LSCS	3.2kg						
61	bala	17	primi	16	9.8	nil	nil	-	-	no	no	no	term	labour natural	2.9kg						
62	Priyanka	19	primi	15	10	+	10	klebshiella	>1,00,000	no	no	no	term	labour natural	2.5kg		*	*	*		
63	preethi	33	G2P1L1	11	9.6	NIL	8	-	-	no	no	yes	Term	Labour natural	1.8kg						
64	indhumathi	30	primi	13	10.8	+	10	ecoli	>1,00,000	yes	no	yes	preterm	LSCS	2kg		*	*	*	*	

Serial No	Name	Age	Obstetric score	Gestational age (weeks)	Hemoglobin (g/dl)	urine albumin	urine pus cells	urine culture	urine bacterial colony count	Cystitis	preeclampsia	IUGR	Fetal outcome	Mode of delivery	Birth weight		Cipro	Norfl	Cef	gara	ampl
65	shivani	19	primi	12	10.6	nil	nil			no	no	no	term	labour natural	3kg			*	*		
66	premalatha	23	G2P1L1	15	12	nil	nil			no	no	no	term	labour natural	2.5kg			*	*		
67	roshini	35	primi	16	11	nil	nil			no	no	no	term	labour natural	2.65kg			*	*		
68	lekha	32	G3P1L1A1	14	8.5	1+	nil			no	no	no	Term	labour natural	2.5kg			*	*		
69	pooja	30	primi	13	11.2	nil	nil			no	no	no	Term	labour natural	2.2kg			*	*		
70	kanchana	31	G4P2L0A1	14	14	nil	nil			no	no	no	preterm	LSCS	2.5kg						
71	priya	25	G2P1L1	15	8.6	2+	3-5 cells			no	yes	yes	preterm	LSCS	1.8kg						
72	madhu sri	26	primi	16	9.3	1+	5 cells			yes	yes	no	term	labour natural	2.5kg						
73	muthulakshmi	24	G2P1L1	15	9.8	nil	4-5 cells	klebshiella	1,00,000	no	no	no	Term	labour natural	2.6kg						
74	pavalam	25	Primi	16	9.6	nil	3-4 cells	-	-	no	no	no	Term	LSCS	2.5Kg						
75	meena	19	G3P1L1A1	13	10.2	nil	nil	-	-	no	no	no	Term	labour natural	3kg						
76	vel	22	Primi	13	10.8	1+	nil	-	-	no	yes	no	term	LSCS	3.6kg						
77	papa	25	Primi	14	11.4	nil	3-5 cells	E-coli	<1, 00,000	no	no	no	Preterm	labour natural	2kg						
78	theivanai	40	G2P1L1	13	12.4	1+	3-5cells	staph aureus	1,00,000	yes	yes	yes	preterm	labour natural	2.6kg						
79	sivaranjini	29	primi	11	7.4	nil	-	-	-	no	no	no	term	labour natural	2.75kg						
80	gunalini	25	primi	15	6.6	nil	3-5cells	E-coli	<1, 00,000	no	yes	no	preterm	labour natural	2kg						
81	karthika	20	G3P2L1	16	11.4	nil	nil	-	-	no	no	no	term	labour natural	3.4kg						
82	meenupriya	25	primi	13	10.6	nil	nil	-	-	no	no	no	term	labour natural	2.7kg						
83	pushpalatha	32	G23P2L2	14	11	nil	nil			no	no	no	term	labour natural	2.75kg						
84	prema	24	primi	15	12	nil	nil	-	-	no	no	no	term	LSCS	3.2kg						
85	latha	17	primi	16	9.8	nil	nil	-	-	no	no	no	term	labour natural	2.9kg						
86	jothi	19	primi	15	10	+	10	klebshiella	>1,00,000	no	no	no	term	labour natural	2.5kg		*	*	*	*	*
87	priya	33	G2P1L1	11	9.6	NIL	8	-	-	no	no	yes	Term	Labour natural	2.5kg						
88	bhavana	30	primi	13	10.8	+	10	ecoli	>1,00,000	yes	no	yes	preterm	LSCS	2kg		*	*	*		*
89	zendaya	19	primi	12	10.6	nil	nil			no	no	no	term	labour natural	3kg			*	*		
90	priyanka	23	G2P1L1	15	12	nil	nil			no	no	no	term	labour natural	2.5kg			*	*		
91	praveena	35	primi	16	11	nil	nil			no	no	no	term	labour natural	2.65kg			*	*		
92	meena	32	G3P1L1A1	14	8.5	1+	nil			no	no	no	Term	labour natural	2.5kg			*	*		
93	lekha sri	30	primi	13	11.2	nil	nil			no	no	no	Term	labour natural	2.2kg			*	*		
94	Pooja Sri	31	G4P2L0A1	14	14	nil	nil			no	no	no	preterm	LSCS	2.5kg						
95	keethrika	25	G2P1L1	15	8.6	2+	3-5 cells			no	yes	yes	preterm	LSCS	2.5kg						
96	Aishwarya	26	primi	16	9.3	1+	5 cells			yes	yes	no	term	labour natural	2.5kg						
97	madhu priya	24	G2P1L1	15	9.8	nil	4-5 cells	klebshiella	1,00,000	no	no	no	Term	labour natural	2.6kg						
98	pradeepa	25	Primi	16	9.6	nil	3-4 cells	-	-	no	no	no	Term	LSCS	2.5Kg						
99	archana	19	G3P1L1A1	13	10.2	nil	nil	-	-	no	no	no	Term	labour natural	3kg						
100	Divya	22	Primi	13	10.8	1+	nil	-	-	no	yes	no	term	LSCS	3.6kg						
101	Bala	25	Primi	14	11.4	nil	3-5 cells	E-coli	<1, 00,000	no	no	no	Preterm	labour natural	2kg						
102	Afroze	40	G2P1L1	13	12.4	1+	3-5cells	staph aureus	1,00,000	yes	yes	yes	preterm	labour natural	2.5kg						
103	kamatchi	29	primi	11	7.4	nil	-	-	-	no	no	no	term	labour natural	2.75kg						
104	meenatchi	25	primi	15	6.6	nil	3-5cells	E-coli	<1, 00,000	no	yes	no	preterm	labour natural	2kg						
105	durga	20	G3P2L1	16	11.4	nil	nil	-	-	no	no	no	term	labour natural	3.4kg						
106	Anupama	25	primi	13	10.6	nil	nil	-	-	no	no	no	term	labour natural	2.7kg						
107	vaitheeswari	32	G23P2L2	14	11	nil	nil			no	no	no	term	labour natural	2.75kg						
108	Naveena	24	primi	15	12	nil	nil	-	-	no	no	no	term	LSCS	3.2kg						
109	gomathi	17	primi	16	9.8	nil	nil	-	-	no	no	no	term	labour natural	2.9kg						
110	praveena	19	primi	15	10	+	10	klebshiella	>1,00,000	no	no	no	term	labour natural	2.5kg		*	*	*	*	
111	priyanka	33	G2P1L1	11	9.6	NIL	8	-	-	no	no	yes	Term	Labour natural	1.8kg						
112	sivani	30	primi	13	10.8	+	10	ecoli	>1,00,000	yes	no	yes	preterm	LSCS	2kg		*	*	*	*	*
113	pradeepa	19	primi	12	10.6	nil	nil			no	no	no	term	labour natural	3kg			*	*		
114	pooja	23	G2P1L1	15	12	nil	nil			no	no	no	term	labour natural	2.5kg			*	*		
115	monisha	35	primi	16	11	nil	nil			no	no	no	term	labour natural	2.65kg			*	*		
116	deepthi	32	G3P1L1A1	14	8.5	1+	nil			no	no	no	Term	labour natural	2.5kg			*	*		
117	nivetha	30	primi	13	11.2	nil	nil			no	no	no	Term	labour natural	2.2kg			*	*		
118	jerlin	31	G4P2L0A1	14	14	nil	nil			no	no	no	preterm	LSCS	2.5kg						
119	sandya	25	G2P1L1	15	8.6	2+	3-5 cells			no	yes	yes	preterm	LSCS	1.8kg						
120	chandrika	26	primi	16	9.3	1+	5 cells			yes	yes	no	term	labour natural	2.5kg						
121	lakshmi	24	G2P1L1	15	9.8	nil	4-5 cells	klebshiella	1,00,000	no	no	no	Term	labour natural	2.6kg						
122	anapoorani	25	Primi	16	9.6	nil	3-4 cells	-	-	no	no	no	Term	LSCS	2.5Kg						
123	rashmika	19	G3P1L1A1	13	10.2	nil	nil	-	-	no	no	no	Term	labour natural	3kg						
124	pandyammal	22	Primi	13	10.8	1+	nil	-	-	no	yes	no	term	LSCS	3.6kg						
125	vel	25	Primi	14	11.4	nil	3-5 cells	E-coli	<1, 00,000	no	no	no	Preterm	labour natural	2kg						
126	Prema	40	G2P1L1	13	12.4	1+	3-5cells	staph aureus	1,00,000	yes	yes	yes	preterm	labour natural	1.6kg						
127	Naveena	29	primi	11	7.4	nil	-	-	-	no	no	no	term	labour natural	2.75kg						
128	jothi	25	primi	15	6.6	nil	3-5cells	E-coli	<1, 00,000	no	yes	no	preterm	labour natural	2kg						

Serial No	Name	Age	Obstetric score	Gestational age (weeks)	Hemoglobin (g/dl)	urine albumin	urine pus cells	urine culture	urine bacterial colony count	Cystitis	preeclampsia	IUGR	Fetal outcome	Mode of delivery	Birth weight		Cipro	Norfl	Cef	gara	ampl
129	muneeswari	20	G3P2L1	16	11.4	nil	nil	-	-	no	no	no	term	labour natural	3.4kg						
130	nivetha	25	primi	13	10.6	nil	nil	-	-	no	no	no	term	labour natural	2.7kg						
131	preethi	32	G23P2L2	14	11	nil	nil			no	no	no	term	labour natural	2.75kg						
132	indhu	24	primi	15	12	nil	nil	-	-	no	no	no	term	LSCS	3.2kg						
133	mathi	17	primi	16	9.8	nil	nil	-	-	no	no	no	term	labour natural	2.9kg						
134	Bathmasree	19	primi	15	10	+	10	klebshiella	>1,00,000	no	no	no	term	labour natural	2.5kg		*	*	*	*	*
135	Pooja sri	33	G2P1L1	11	9.6	NIL	8	-	-	no	no	yes	Term	Labour natural	2.5kg						
136	lakshmi priya	30	primi	13	10.8	+	10	ecoli	>1,00,000	yes	no	yes	preterm	LSCS	2kg		*	*	*	*	*
137	nagalakshmi	19	primi	12	10.6	nil	nil			no	no	no	term	labour natural	3kg			*	*		
138	meena	23	G2P1L1	15	12	nil	nil			no	no	no	term	labour natural	2.5kg			*	*		
139	karthika	35	primi	16	11	nil	nil			no	no	no	term	labour natural	2.65kg			*	*		
140	meenupriya	32	G3P1L1A1	14	8.5	1+	nil			no	no	no	Term	labour natural	2.5kg			*	*		
141	priya	30	primi	13	11.2	nil	nil			no	no	no	Term	labour natural	2.5kg			*	*		
142	prema	31	G4P2L0A1	14	14	nil	nil			no	no	no	preterm	LSCS	2..5kg						
143	archana	25	G2P1L1	15	8.6	2+	3-5 cells			no	yes	yes	preterm	LSCS	2.5kg						
144	premalatha	26	primi	16	9.3	1+	5 cells			yes	yes	no	term	labour natural	2.5kg						
145	sandhya	23	G2P1L1	15	12	nil	nil			no	no	no	term	labour natural	2.5kg						
146	shiva	35	primi	16	11	nil	nil			no	no	no	term	labour natural	2.65kg						
147	durga	32	G3P1L1A1	14	8.5	1+	nil			no	no	no	Term	labour natural	2.5kg						
148	kamatchi	30	primi	13	11.2	nil	nil			no	no	no	Term	labour natural	2.2kg						
149	rasathi	31	G4P2L0A1	14	14	nil	nil			no	no	no	preterm	LSCS	2.5kg						
150	amala	25	G2P1L1	15	8.6	2+	3-5 cells			no	yes	yes	preterm	LSCS	1.8kg						