ASYMPTOMATIC BACTERIURIA: COMPARATIVE STUDY OF BACTERIAL CULTURE AND GRIESS NITRITE TEST

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Asymptomatic bacteriuria is a clinically significant condition, particularly during pregnancy. Some of the complications during pregnancy like pyelonephritis, prematurity, pre-eclamptic toxemia and L.B.W. babies may be more frequently associated with asymptomatic bacteriuria. In view of this a comparitive study of Griess Nitrite test and urine culture for bacterial count was undertaken in antenatal, intranatal and postnatal cases for detection of asymptomatic bacteriuria.

Material and Methods

One hundred and ten cases attending regular antenatal clinic and maternity ward, without any specific urinary complaint, at Zanana Hospital, Udaipur were included in the study. These were closely followed during pregnancy, labour and puerperium to detect any complication. In each case following tests were carried out.

1. Routine urine examination.
2. Microscopic examination of a smear prepared from sediment formed after centrifuge of 5 mls. of urine for evidence of pus cells, epithelial cells, crystals, casts and red blood corpuscles. A count of more than 5 pus cells per high power field was considered significant and such cases were excluded from the study.
3. Griess Nitrite test.

It was carried out as follows—

To 1 ml. of urine in a test tube 1 ml. of already prepared Nitrite reagent was added to get pink or red colour indicating positive nitrite test. Nitrite reagent is a solution of sulfanalic acid and alphanaphthylamine in acid base kept prepared in a coloured bottle to last without being spoilt for a couple of weeks. It is colourless, crystal clear and odourless. It is prepared by dissolving 1.5 gms. of sulphanalic acid in 450 mls. of 10% acetic acid and this mixture is added to a solution of 0.6 gms of alphanaphthylamine dissolved in 60 mls. of boiling distilled water. An outdated solution develops a pink colour or some crystals.

4. Bacterial culture of aseptically collected urine sample was done on modified MacConkey's medium, Glucose broth, Nutrient broth and Blood agar. After identifying the morphology, colony character and biochemical properties, bacterial count was done by standard loop technique and as per bacterial count the positive cases were divided into three groups A, B and C.

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Observations

Incidence of asymptomatic bacteriuria as studied by bacterial culture and Griess Nitrite test was 9.09% (10 positive out of 110 cases) and by nitrite test was 8.18% (9 positive out of 110 cases). (Table I).

TABLE I
Incidence of Asymptomatic Bacteriuria by Two Methods

Method	No. of positive cases	Percentage
Griess Nitrite Test	9	8.18
Bacterial culture	10	9.09

Out of 10 positive cases of bacterial culture, 4 (3.6%) had significant bacteriuria (Group A), 2 (1.8%) had moderately significant bacteriuria (Group B) and 4 (3.6%) had insignificant bacteriuria (Table II).

trimester, 7 (7.0%) cases in third trimester, 5 (5.6%) during labour and 5 (5.0%) cases in purperium.

A comparision between results of bacterial culture and Griess Nitrite test was made (Table III). A positive Griess Nitrite test co-related with positive culture in 7 cases. Out of these 7 cases, 6 cases belonged to Group A and Group B of bacteriuria and 1 case belonged to group C. In 3 positive culture cases Griess Nitrite test was negative. In 2 cases Nitrite test was false positive.

Bacterial culture count	Griess nitrite test	
Group	No. of positive cases	Accuracy rate %
A	4	100
B	2	100
C	4	25

Reliability of Griess Nitrite test varies according to the severity of bacteriuria.

TABLE II
Incidence of Various Groups According to Bacterial Count and it's Clinical Significance

Groups as per bacterial count per ml. of urine	Severity	No. of cases	Percentage
Group A 100,000 or more	Significant	4	3.6
Group B 10,000 to 100,000	Moderately significant	2	1.8
Group C Below 10,000	Insignificant	4	3.6

Out of 110 cases, 50 cases were primigravida and 60 were multiparae. Among the positive cases 7 (14%) were primigravida and 3 (5%) were multigravida.

Cases studied in first trimester were 70, second trimester 110, third trimester 100, during labour 90 and followed till puerperium 100 cases. Asymptomatic bacteriuria was detected in 1 (1.5%) case in first trimester, 2 (1.9%) cases in second

In significant and moderately significant bacteriuric cases it was highly reliable (100%), while in insignificant bacteriuric cases it was very little reliable (25%). Hence on average it was reliable in 75% cases.

Bacteriuric cases in the present study showed higher incidence of various complications during pregnancy and labour. Three cases had pre-eclamptic toxaemia,

out of which 1 developed postpartum eclampsia. One case already had previous bad obstetrical history and the present pregnancy ended in second trimester abortion. One case each had preterm delivery, unexplained still birth, L.B.W., caesarean section for foetal distress and present conception after a long period of infertility. Only 1 case had a normal course and outcome of prengancy.

Discussion

Asymptomatic bacteriuria is a significant clinical entity during pregnancy. It's incidence ranges from 5 to 15% in pregnant cases. Kass (1960) found significant bacteriuria in 6.11% of pregnant women. In the Indian literature Mukerjee and Nawal Kishore (1967) reported 13%, Kakoty *et al* (1974) 10%, Roy and Sinha (1974) 12.4% and Sinha (1977) 15.5% bacteriuria in pregnant women. It's incidence is higher in primigravida. The most critical period to develop asymptomatic bacteriuria is third trimester of pregnancy. It may be on account of maximum changes in urinary tract at that time.

Out of the two methods carried out to detect asymptomatic bacteriuria, bacterial culture and count is more accurate. But it is more time consuming, expensive and is not practical for screening of antenatal cases in our circumstances. Griess Nitrite test is simple, quick, relatively inexpensive and can be easily carried out in antenatal cases without much of a laboratory facility. It showed false negative result in 30% of bacteriuric cases while in general if showed false positive result in 1.8% of cases. Still, it could be fully corelated with all the cases of significant and moderately significant bacteriuria (Group A and Group B). However it's accuracy rate (70%) should not be overlooked.

Asymptomatic bacteriuric cases showed various deviations for the normal course of pregnancy and outcome of pregnancy. A comparative study with abacteriuric cases could not be carried out as positive cases were only 10. One of the contributory factor for various complications observed may be majority of the bacteriuric cases (70%) were primigravida.

Summary

One hundred and ten cases attending antenatal clinic were screened for asymptomatic bacteriuria by bacterial culture and Griess Nitrite test. Incidence of asymptomatic bacteriuria was found to be 9.09% by bacterial culture and 8.18% by Griess Nitrite test. A comparision of two methods was done. A comparative study of various complications related to pregnancy and childbirth in bacteriuric and abacteriuric cases could not be carried out as positive cases were only 10. Still looking into the course and outcome of pregnancy in bacteriuric cases, we feel this condition should not be overlooked during pregnancy.

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