GRIESS NITRITE TEST TO DETECT—BACTERIURIA IN PREGNANCY

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SUMMARY

Two hundred pregnant patients urine samples were examined. The urine was subjected to urine culture, and Griess Nitrite Test. E. Coli was the most common organism causing bacteriuria. Reliability of Griess Nitrite Test was 61.1% in bacteriurics.

Introduction

Urinary tract infection is very common in pregnancy and complication of it are also well known. Even if symptoms are absent bacteriuria during pregnancy is potentially serious. Hence early detection of asymptomatic infection is very important. Urine culture is the ideal method of detection of bacteriuria, but it requires laboritory facilities and it is expensive and time consuming.

The ideal screening agent for asymptomatic bacteriuria must be inexpensive, easy to use, very reliable and suitable for use on large scale population group. The Griess Nitrite test is inexpensive and easy to perform than the other chemical tests. The reliability of this test is studied and discussed.

Material and Method

Randam samples of urine of 200 pregnant women were examined in the antenateal clinic of Government Medical College, Nagpur. Urine was examined by culture method as well as by Griess method. All patients had amenorrhoea for a period of more than 3 months.

Griess Method: The principle of this test is the detection of nitrite in the urine. Nitrate is present in the urine. Nitrate in the urine is derived mostly from fruits and vegetables. Bacteria in the urine reduces nitrate in to nitrite which is detected by the reagent. The reagent is acid solution of sulphanilic acid and alpha-naphthylamine, which undergoes a diazo reaction with nitrite forming red azo dye. Positive test requires that urine should remain in bladder long enough for bacteria to reduce a sufficient amount of nitrate.

Reagent: The Griess reagent was prepared by dissolving 1.5 gram of sulphanilic acid in 450 ml of 10 % acetic acid. The mixture was added to a solution of 0.6 gram of alpha-naphthylamine dissolved gram of alpha-natphthylamine dissolved in 60 ml of boiling distilled water. The reagent remains stable for several months if stored in amber coloured bottle in the refrigerator.

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Patients were told to collect urine in sterile bottles. Development of pink to dark red colour indicates a positive test.

Observation

All patients had amenorrhoea for a period of more than 3 months. Out of 200 patients, 40 patients had positive urine culture. *E. Coli* was the commonest organism. Out of these 40 patients, 4 had non-pathogenic staphynococcoe in their urine culture, hence these patients were excluded from the study as they were taken as contaminated samples. Out of 36 bacteriurics, 22 had positive Griess test showing 61.1 % reliability of this test.

Ten patients out of 200 patients had symptoms related to the urinary tract. Out of these 190 asymptomatic patients, 28 patients had positive urine culture, incidence being 14.7%. Out of these 28, 17 had positive Griess nitrite test showing 60.7% reliability. Out of these 190 asymptomatic patients, the prevalence rate of bacteriuria was 9% by Griess test. Out of 17 patients with positive Griess test, 15 patients had *E. Coli* infection and 2 had staphylococcal infection.

Discussion

Shivdasani *et al* (1969) have shown that the incidence of bacteriuria was 3.25% in 2000 normal pregnant women, by Griess nitrite test. Sinha (1977) studied 400 pregnant cases. She found the incidence of bacteriuria to be 13.5% by Griess Test and 15.5% by culture method. In this series, 190 asymptomatic pregnant patients were sudied. The prevalence rate of bacteriuria was 9% by Griess test and 14.7% by culture method.

In the published reports the success of the Griess Nitrite test in detecting bacteriurics varies, 50% by Smith *et al* (1961), 60% by Deutch and Jespersen (1964), 80% by Turner (1961) and 87.09 per cent by Sinha (1977). The reliability of Griess nitrite test according to this series was 60.77%.

The ability to reduce nitrate to nitrite is possessed by all gram negative bacilli belonging to the general of Escneria. Klebsiella, Citrobacter Proteus, Salmonella, Shigella, Staphylococci aureus, and staphylococci albus, but this property is not found in streptococci. Therefore, this test might be less successful if it was applied to urines from patients with chronic infection where the pathogen is more likely to be an organism which either does not reduce nitrates at all, for e.g. enterococcus, or does so at a slower rate, for e.g. Pseudomonas aeroginosa. Nevertheless, *E. Coli* is most of the responsible organism responsible for asymptomatic bacteriuria and so Griess test is quite useful. In this series, 17 patients out of 28 asymptomatic bacteriuria had positive culture and positive Griess Nitrite Test. Fifteen patients had *E. Coli* infection and 2 had staphylococci infection.

References

1. Deutch, M. and Jespersen, H. G.: Acta. Med. Scand. 175: 191, 1964.
2. Shivdasani, M., Joglekar, S. and Acharya. A.: J. Obstet. Gynec. India. 19: 470, 1969.
3. Sinha, S.: J. Obstet. Gynaec. India. 27: 538, 1977.
4. Smith, L. G., Thayer, W. R., Malta, E. M. and Utz, J: P.: Ann. Int. Med. 54: 66, 1961.
5. Turner, S.: Lancet. 2: 1062, 1961.