isoxuprine, is discussed with reference to a small series in Bantu patients. Treatment was successful in 6 out of 8 cases, with a further probable success and only one failure. There was no serious maternal or foetal morbidity.

We wish to thank Dr. E. A. Barker, Medical Superintendent of the Charles Johnson Memorial Hospital, for permission to use hospital records, and Mrs. A. Reynolds and Sister J. Conway for their valuable assistance.

THE INVESTIGATION OF BACTERIURIA IN PREGNANCY*  

Since the studies of Kass,1–2 routine screening for asymptomatic bacteriuria by means of bacterial counts has become an accepted part of antenatal care. Dixon and Brant3 stated that the value of bacterial counts in the detection of pyelonephritis of pregnancy had been overemphasized. Most writers, however, agree with Williams et al.4 that the relationship between bacteriuria and acute and chronic pyelonephritis seems beyond doubt and that the prevention of these conditions is sufficient reason to make routine screening for bacteriuria essential.

In practically all the published work the specimens of urine used for bacteriological examination have been midstream urine collections. Sleigh5 and Williams et al.4 stressed the importance of the technique of midstream urine collection and of the careful handling of the specimen, but this has received little mention in other articles.

Before embarking on a programme of routine screening for bacteriuria, it was decided to investigate the importance of the technique of midstream collection on bacterial counts in the urine. Two series of patients were investigated. In the first series, no special instructions were given regarding the method of midstream urine collection, or of handling of the urine specimens, which were delivered to the laboratory by the usual hospital service. In the second series, strict criteria were laid down for the method of collection and for the transport of the specimens to the laboratory, with particular attention to the technique of vulval cleansing, and the efficiency of two cleansing agents.

MATERIALS AND METHODS

All the patients were healthy, pregnant females with no evidence of urinary tract infection. No postpartum cases were included.

In the first series, 78 midstream specimens of urine were collected from patients attending the Antenatal Clinic at the Peninsula Maternity Hospital, and sent to the Bacteriology Laboratory in Groote Schuur Hospital by the usual hospital service.

In the second series, 87 midstream specimens of urine were collected during the morning from ward patients in the Groote Schuur Maternity Block. The method of collection was as follows:

The patient stood astride the toilet and held her labia apart. The nurse collecting the specimen, then swabbed the vulva with 3 separate sterile cottonwool swabs, soaked in either 0·5% aqueous chlorhexidine or sterile normal saline. Half the patients were swabbed with the first and the other half with the second solution. The patient then commenced to pass urine and the nurse collected not less than 10 ml from the middle of the stream into a clean plastic container with a clip-on lid. The container was then labelled and delivered immediately by the house surgeon to the laboratory in the hospital. Care was taken that the patient had not passed urine for at least 4 hours before the collection of the specimen.

In the laboratory each urine specimen from both series was treated as follows:

(a) A semi-quantitative count was carried out as described by Leigh and Williams.6 In principle, a measured area of blotting paper is used as a vehicle for transferring a constant aliquot of urine to the surface of a culture medium. From the number of colonies on the inoculated area the number of organisms in the urine may be calculated.

(b) Wet preparations and Gram-stained smears were examined microscopically, and if pus cells or organisms were noted in the 2 preparations, the urine was cultured by plating onto a MacConkey agar plate and Hartley agar or blood-agar plate.

RESULTS

First Series

Of the 78 specimens, only 5 (6·5%) failed to show any bacterial growth on culture. Sixty-eight (87%) were obviously contaminated as shown by either a heavy vaginal flora on microscopic examination of Gram-stained smears or by a quantitative bacterial count of more than 100,000 organisms per ml with a mixed growth of microorganisms on the culture plates. The remaining 5 specimens (6·5%) had a count of more than 100,000 organisms per ml with a pure growth on culture, but the findings on microscopy showed that these too were probably contaminated. Nineteen of the urines were a day old when received at the laboratory and all were heavily contaminated.

Second Series

Of the 87 urines, 44 (51%) showed no growth on culture. Thirty-five (40%) were contaminated as shown by either a scanty vaginal flora on examination of Gram-stained smears and no growth using the semi-quantitative tech-
nique, or an insignificant count in the absence of organisms on microscopy of stained smears. The degree of contamination in this series was thus slight and normally none of these urines would have been cultured.

Using both the semi-quantitative method and routine urine culture, therefore, 79 specimens (91%) showed no evidence of bacteriuria. Five specimens (6%), all from the same patient, taken on different days, appeared suspicious on the semi-quantitative count, but cultural examination showed no pathogens.

Three urines, 2 from the same patient, or 3%, had a count of more than 100,000 organisms per ml. Culture showed a pure growth of coliform organisms in 2 and a pure culture of a proteus species in the third specimen. These 3 urines thus indicated true asymptomatic bacteriuria.

DISCUSSION

In an effort to prevent pyelonephritis of pregnancy and its possible sequelae, patients with asymptomatic bacteriuria are now treated purely on the result of midstream urine culture. The large percentage of heavily contaminated urines obtained in the first series clearly shows the great importance of a meticulous technique in the collection of specimens and their early delivery to the laboratory.

The investigation presented here is a simple one but is of fundamental importance in the routine screening of antenatal patients, and is of equal significance if midstream urines are to be of any value in the bacterial examination of clinical urinary tract infection.

Suprapubic cystostomy is the most reliable method for obtaining uncontaminated urine, but this procedure is less convenient and not entirely without risk. It has been shown that properly handled midstream urine collections give satisfactory results when compared with simultaneously obtained suprapubic specimens.

In the collection of midstream urines some form of vulval cleansing is essential to avoid contamination with vulval or vaginal organisms. Roberts et al. showed that the use of antiseptics in cleaning the vulva may interfere with bacterial growth and result in a lower colony count. They suggested the use of sterile water for swabbing.

These workers also pointed out that for optimum detection of such patients, an early morning specimen is preferable as the bacterial count gradually drops during the day. Where this is impractical, it is important to wait at least 2 and preferably 4 hours after the last micturition, before collecting the midstream urine. The patient should not be given excessive water to drink in order to be able to produce an earlier specimen, as a diuresis results in a lowered bacterial count of infected urine.

Probably the most important factor in preventing false results is the immediate delivery of the urine to the laboratory. Where this is impossible, specimens must be stored in a refrigerator at 4°C as soon as possible after collection and certainly within 10-15 minutes. The first series showed the effect of keeping specimens unrefrigerated overnight. A refrigerator is therefore essential in the urine-testing room before embarking upon routine screening for bacteriuria. Refrigerated urine may be kept overnight without fear of significant bacterial multiplication.

Using the abovenamed precautions, routine screening for bacteriuria was recently introduced at the Booking Clinics of the Peninsula Maternity Services at Groote Schuur Hospital, without any difficulty and with consistently reproducible results. We believe that routine examination of the urine for bacteriuria is an essential part of antenatal care.

SUMMARY

The importance of adhering to a careful technique in the collection, storage and delivery to the laboratory of midstream urines for bacterial counts is stressed. This is illustrated by comparing the results in 2 series, in one of which no special care was taken in handling the specimens, whereas in the second series strict criteria of collection and delivery of the specimens were observed.

It is concluded that unless strict precautions are taken, the examination of midstream urines for bacterial counts becomes valueless.

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REFERENCES


PROGRESS REPORT ON THE USE OF INTRA-UTERINE CONTRACEPTION IN PRIVATE PRACTICE*

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In my preliminary report on the use of intra-uterine contraception in private practice1 I mentioned the 2nd International Conference on Intra-Uterine Contraception which was held in New York during October 1964. Since then we have received a number of progress reports compiled by Dr. Tietze at the Population Council, and the 7th Progress Report was published in September 1966. As the years went by and the number of woman-months of exposure increased, it became clear that the undesirable side-effects and failures appeared more often than we had previously thought. As this was also my impression in private practice, I decided to take a long, hard look at intra-uterine contraception in general, and its use in private practice in particular.

COMPARISON OF RESULTS

I decided to compare the failures, complications and other side-effects as were experienced by the Population Council in their large series of clinic practice, a combined series of