

Although impossible to assess the effect of malnutrition, it seems certain that it would have contributed to a proportion of the deaths.

REFERENCES

Colson, E., (1967), *The Social Organization of the*

Gwembe Tonga, Manchester University Press.
King, M., (1966), *Medical Care in Developing Countries.*

Scudder, T., (1968), *The Ecology of the Gwembe Tonga, Manchester University Press.* ●

Asymptomatic Bacteriuria of Pregnancy in Zambia

D. JENKINSON M.B., Ch. B., D. Obst., R.C.O.G., D.C.H.,
Medical Officer, Nchanga Consolidated Copper Mines Ltd.,
Chingola Division

SUMMARY

A survey of 500 Zambian antenatal patients revealed a 3.8% incidence of asymptomatic bacteriuria.*

INTRODUCTION

Interest in asymptomatic bacteriuria has increased since large groups of individuals were studied by Kass (1956). Subsequent studies by the same author (Kass, 1960a, 1960b) appeared to show an increased incidence of acute pyelonephritis and prematurity when this condition was associated with pregnancy. Further studies in many parts of the world have confirmed that this condition is present in approximately 4% of all pregnant women. The condition is not confined to pregnancy. It is believed that there is a variable 4% of all women who demonstrate asymptomatic bacteriuria and that pregnancy is a state in which the condition may become symptomatic and recognised.

The full significance of the condition has for a long time remained in doubt, but the picture is gradually becoming clearer. The lower urinary tract in the female is probably frequently assaulted by bacteria from the lower urethra as a result of coitus. These are normally eliminated rapidly without symptoms but may occasionally cause the female urethral syndrome which is anyway usually self limiting. It appears that occasionally, possibly as a result of these onslaughts of bacteria, infection may ascend the urinary tract and maintain itself without producing symptoms. Kass (1962) found a 25% spontaneous cure rate per annum in affected women, and it would seem reasonable to suppose that a similar number with previously sterile urine become bacteriuric. If

there is an underlying structural abnormality of the renal tract, it is more likely that infection will remain and in other patients it may possibly lead to chronic pyelonephritis. It seems very likely that bacteriuric women consist of two sub-groups, a smaller one who have an underlying abnormality of the renal tract and constant bacteriuria and/or chronic pyelonephritis and a larger group who have no underlying abnormality and would possibly clear spontaneously if left alone. Probably as a result of ureteric dilatation and hypertrophy, pregnancy brings to light these infections in many cases. Of all pregnant women with asymptomatic bacteriuria approximately 25% develop acute pyelonephritis during pregnancy (Little 1966). Earlier studies were thought to indicate that prematurity was associated with this condition. More recent research has suggested that only those cases in which there is underlying parenchymal infection of the kidney are in fact predisposed to premature labour (Brumfitt, Gruneberg and Leigh, 1967). Similarly there is conflicting evidence about its association with anaemia, and again it seems likely that it is only associated with chronic renal infection.

The importance of recognising this condition is therefore twofold. Firstly the incidence of acute pyelonephritis in pregnancy can be reduced by two-thirds and secondly it brings to light those patients with underlying chronic renal infection or structural abnormalities.

There is no satisfactory, simple way of making the diagnosis. The tetrazolium chloride test and the Griess test, although satisfactory for overt urinary infection, are generally unsatisfactory at the bacterial counts which may be found in asymptomatic infec-

tion. The only really satisfactory method is to perform a colony count on a freshly voided mid-stream specimen of urine, and it has been determined that when this count exceeds 10^5 bacterial per ml. on two separate specimens there is a 96% probability of there being a urinary infection. This method is open to errors particularly in the method of handling and storing of specimens but the development of the urinary dipslide has eliminated most of these problems, since the plating is done immediately after a specimen is obtained and it matters not whether the culture is then stored or transferred to an incubator immediately. Cultures may be read after 15 hours when incubated at 37°C or after 3 days if left at normal room temperature.

Treatment is generally straightforward — seven days of urinary antiseptic normally being sufficient to sterilise the urine. Relapse must be watched for since this is particularly likely to occur in those patients who have an underlying renal abnormality. A good case can be made for doing intravenous urography on all patients found to have asymptomatic bacteriuria. It is worth noting that 90% of all cases are due to *E. coli*.

The present study was initiated in order to determine the incidence of asymptomatic bacteriuria in Zambian ante-natal patients.

METHOD

A mid-stream specimen of urine was obtained from 500 consecutive patients attending antenatal clinic for the first time. Uricult dipslides (Orion Laboratories) which consist of a glass slide coated with nutrient agar on one side and MacConkey agar on the other and contained in an individual bottle, were then coated with urine and sent for incubation. The dipslides were read after 18 hours by comparing the density of colonies with a chart supplied by the manufacturer. A growth of 10^5 per ml. or more of a possible urinary pathogen was regarded as positive. A catheter specimen of urine was then obtained from the patient and similarly cultured for confirmation. A growth of 10^4 per ml. from a catheter specimen of the same organism was regarded as confirmation of bacteriuria. All patients from whom a catheter specimen was obtained received a course of a urinary antiseptic regardless of whether the specimen demonstrated infection.

RESULTS

Thirty-two of the 500 initial specimens were found to be positive. Five of these were lost to follow-up and of the remaining 27, 19 were confirmed posi-

tive from a catheter specimen. The infecting organism in all but one case was *E. coli*, the exception being due to *Proteus*. The high rate of false-positives was due to heavy contamination as a result of difficulty in obtaining a mid-stream specimen from the patient. In the vast majority of these cases the contamination origin of the growth was apparent from the mixed nature of the growth, usually of unlikely urinary pathogens. The infection rate in this series was therefore 3.8%.

DISCUSSION

Colony counting is the only satisfactory method of diagnosing urinary infection from a mid-stream specimen. The results obtained from dipslides compare very favourably with more elaborate colony counting methods and error is generally on the false-positive side (Jackman et al 1973). The greatest advantage of the dipslide is that plating is done immediately on a freshly voided specimen, if necessary by the patient herself, and once this is done there is no urgency to transport the tubes for incubation, as the storage does not significantly influence the colony count. The operation is also much quicker than pour plate or even standard loop methods. The chief disadvantage of this method is that urine for microscopy has to be sent in a separate container.

The results of this survey indicate that the incidence of asymptomatic bacteriuria of pregnancy in Zambia is the same as that in all populations so far studied.

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REFERENCE

- Brumfitt, W., Grunberg, R.N., and Leigh, D.A., (1967), in *Symposium on Pyelonephritis*, 20, Livingstone, Edinburgh.
Jackman, F.R., Darrel, J.H., and Shackman, R., (1973), *British Medical Journal*, 1, 207.
Kass, E.H., (1956), *Transactions of the Association of American Physicians*, 69, 56.
Kass, E.H., (1960a), *Bacteriology Review*, 24, 177.
Kass, E.H., (1960b), *Archives of Internal Medicine* 105, 194. ●