

# PREGNANCY AND THE LOWER URINARY TRACT: PART II

## URINARY BACTERIOLOGICAL AND MICROSCOPICAL STUDIES ON 300 PREGNANT FEMALES

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An attempted explanation for the common urological symptoms of pregnancy requires, as far as is practically possible, an evaluation of all the possible causative factors. In Part I evidence in support of the hormonal theory was produced. It was therefore necessary to ascertain the role of infection in the production of these symptoms.

The urine of all pregnant females attending the antenatal clinic at the South Rand Hospital, and who presented with possible urological signs and symptoms, was examined both microscopically and bacteriologically.

The study pertains to 300 pregnant females attending the clinic between February 1959 and April 1963.

### METHOD

It must be clearly understood that none of the cases were investigated for toxæmia of pregnancy *per se*, but only for possible urinary infection. They were all investigated on the instructions of the attending physicians at the antenatal clinic. All the patients who presented with symptoms or signs which might possibly indicate urinary infection were selected and midstream catheter specimens were obtained from them. These specimens were forwarded to the hospital laboratory (SAIMR) for microscopical investigation and culture.

Records were kept of the following information: Date; antenatal registration number; serial number; name of the patient and duration of pregnancy as assessed by the attending physician. A résumé of the presenting signs and symptoms which led the physician to believe that urinary investigation was necessary was also noted.

Special columns indicated the presence or absence of dysuria, frequency and stress incontinence. In separate columns the results of the investigation were noted. These

were reaction of urine, presence or absence of albumin, sugar and acetone, and the results of the microscopic investigation and of the urinary culture.

### RESULTS

There were 258 cases where no culture was obtained, an incidence of 86%. The symptoms associated with negative culture were urinary frequency (184 cases) and frequency with stress incontinence (74 cases).

There were 42 cases of positive culture, of which 11 cases (14%) contained contaminant organisms only. Exclusive of contamination there were 31 positive cultures with an incidence of 10.3%. An analysis of these is presented in Table I.

TABLE I. ANALYSIS OF POSITIVE CULTURES

Result	No.	%	Organisms	Main symptoms
Negative culture	258	86	Nil	Frequency, stress incontinence
Positive culture	42	14	<i>E. coli</i> and contaminants	Dysuria, frequency, pain
Significant bacteriuria	21	10.3	<i>E. coli</i> (27) <i>Candida albicans</i> (1) <i>B. paracolon</i> (2) Enterococci (1)	
Contaminants	11	3.7	<i>Staph. albus</i> <i>Staph. saprophyticus</i> Diphtheroid B. <i>P. morgani</i> <i>P. mirabilis</i> <i>Trichomonas vag.</i>	

Laboratory study of 300 consecutive pregnancies with urological symptoms (South Rand Hospital 1959-1963).

### Stress Incontinence

Seventy-eight patients (26%) complained of stress incontinence. Of the 78 cases, only 4 were associated with positive culture, of which in 2 cases the cultures contained scanty growth of contaminant organisms only. Thus, of the 78 cases, only 2 were associated with true positive cultures, i.e. 2.5%.

Stress incontinence relative to duration of pregnancy was recorded in 200 cases only. Unfortunately, during the early phases of the experiment a note about the height of the fundus was omitted in some cases; therefore the last 200 cases only were assessed for this purpose (Table II).

TABLE II. CASES WITH STRESS INCONTINENCE

Result	Number	%	First trim.	Second trim.	Third trim.
Stress incontinence	78	26			
Positive culture	4	5			
Significant bacteriuria	2	2.5			
Stress incontinence in last 200 cases	59	29.5	3	25	31

In the last 200 cases the incidence of stress incontinence is therefore 29.5%.

### DISCUSSION AND CONCLUSION

It is necessary to stress that the foregoing investigation was primarily a clinical experiment. It is not intended to claim that negative culture excludes the existence of urinary tract infection in the pregnant female. It is fully realized that the aetiology of these infections presents a complex problem, at present of very topical importance, especially with regard to pyelonephritis. Negative bacteriology for the common pathogens; absence of pyuria; indeed, even negative renal biopsy, do not exclude urinary tract infection, especially pyelonephritis.<sup>1</sup>

Although it is difficult to interpret what actually constitutes satisfactory and definite diagnosis of urinary tract infection in the absence of pyuria and bacteriuria, it would seem that the presence of significant bacteriuria (bacterial counts of 100,000/ml. of urine or more) with the additional presence of pus cells is not in dispute,\* and

that a positive finding in this respect can with confidence lead to the diagnosis of urinary tract infection.

Contamination of the specimen can, of course, lead to a false positive culture; either with the use of the catheter or the more modern 'clean catch' method. It was thought that this did not represent too great an obstacle in the interpretation of the results of the experiment; in the first instance because there was very little delay between collection and laboratory investigation (the laboratory used was in the hospital). In the second instance contaminants were not difficult to isolate, because of (a) uncommon organisms and (b) scanty cultures. In the third instance, all possible contaminants are included in the over-all figure.

In short, it is freely admitted that a small minority of the 'healthy' patients may possibly have suffered from undetected urinary tract infection, although it is felt that with negative culture and in the absence of other serious symptoms (especially in the pure 'stress incontinence' cases) this possible number is merely of academic importance.

The figure of a 14% (corrected to 10.3%) incidence of significant bacteriuria is higher than the 7% figure obtained in the studies conducted in the Simpson Memorial Maternity Pavilion, Edinburgh Royal Infirmary.<sup>1</sup> This, however, is understandable as the Edinburgh figures apparently relate to all pregnant females attending the clinic.

The symptom pattern associated with clinical urinary infection in the present series is clear-cut, and can be condensed to pain, dysuria and frequency.

On the other hand, more than a quarter of the cases complained of stress incontinence and, of these cases, only 2.5% were associated with infection. From these results it seems clear that urinary tract infection plays little or no part in the production of this symptom during pregnancy.

I wish to thank the various registrars in my department at the South Rand Hospital for assistance with the clinical investigation, and Dr H. Rompel, lately the Superintendent of the South Rand Hospital, for granting the facilities of the hospital in order to obtain the necessary pathological investigations.

### REFERENCE

1. Murdoch, J. McC. (1963): *Modern Trends in Gynaecology*. London: Butterworths.

\*Significant bacteriuria without pus cells is the subject of some controversy and current research.