Technical methods

Collection of urine from women for bacteriological examination

K. B. LINTON AND W. A. GILLESPIE *From the Departments of Bacteriology, University of Bristol and the United Bristol Hospitals*

The reliability and convenience of different methods of

collecting midstream urine specimens free from significant contamination was investigated in controlled trials.

Young and middleaged women, including those in early pregnancy, easily provided satisfactory specimens without the help of a nurse. It was more difficult to obtain good specimens from old or infirm patients, but collection was made much easier by using a specially designed toilet pan.

In a trial with antenatal patients, preliminary cleansing of the genitalia did not significantly influence the frequency or amount of contamination.

FIG. 1. Viable bacterial counts in paired specimens of urine from 81 female urological patients, obtained by catheter and by a careful midstream method with the help of a nurse.

FIG. 2. Viable bacterial counts in midstream specimens of urine from antenatal patients, with and without preliminary cleansing of the vulva.

FIG. 3. Viable bacterial counts in paired specimens of urine from 53 medical inpatients, obtained by Specitest and funnel methods.

Received for publication 15 August 1968.

Doubtful results, with colony counts between 10^4 and 10^5 per millilitre, can usually be disregarded if the organisms are micrococci or *Staph. albus* but must be repeated if they are Gram-negative bacilli.

METHODS

Surface viable counts were performed in the first investigation by a standard loop method (Gillespie, Linton, Miller, and Slade, 1960) and in subsequent investigations by inoculating dilutions of urine made with 0.02 ml dropping pipettes.

The first investigation was in 81 urological patients from whom catheter specimens of urine were obtained at cystoscopy. A midstream specimen was also obtained from each patient by the method of Hart and Magee (1957) which requires the attendance of a nurse to cleanse the genitalia and hold the specimen container. The midstream specimens on the whole showed more contamination than the catheter ones, but none were heavily contaminated. No colony counts fell within the doubtful range between 10^4 and 10^5 organisms per ml (Fig. 1).

Although these results were satisfactory, this method of obtaining midstream specimens would be impracticable in busy departments, such as antenatal clinics.

In the Bristol Maternity Hospital, the method of Brumfitt and Percival (1964) is used, modified by employing sterile saline instead of disinfectant for swabbing the vulva. The unaided patient obtains the specimen herself, after simple instruction by the nurse and guided by a printed instruction card. In order to determine whether preliminary swabbing of the genitalia was necessary, a controlled trial was carried out; patients attending the antenatal clinic on certain days swabbed the vulva and patients attending on other days, did not. The results were almost identical (Fig. 2). Five per cent of the results fell in the doubtful range and had to be repeated. However, in most of them the organisms were *Staph. albus* or micrococci and in these cases, repeat specimens were normal. It therefore seems that swabbing is unnecessary, as Turner (1961) also found. Doubtful results need only be repeated when Gram-negative bacilli are grown, at any rate in antenatal patients.

The next investigation was in a more difficult group, general medical inpatients, all of whom could get out of bed with the help of a nurse. Specimens were obtained by means of a toilet pan designed for this purpose, the Specitest¹ (Fitzgerald 1964). A disposable carton is placed on the ledge of the pan (Fig. 4). The patient sits on the seat and when micturition begins, moves forward so that the stream of urine enters the carton. The carton is grasped by a clothes peg and emptied into a sterile specimen jar for bacteriological examination. The clothes peg and carton are discarded. To evaluate this method, two specimens were obtained from each of 53 medical inpatients, one by means of the Specitest and the other by the method of Leather and Hutchings (1960), in which a small tube or funnel is held by the nurse over the urethral orifice to minimize contamination. The tube method is inconvenient and is not recommended for

¹ Armitage Excelsior Ltd.

FIG. 4. Specitest apparatus with disposable carton.

routine use, but it was a good standard for comparison since it gave less contamination than any other midstream method, with results almost identical with those obtained from catheter specimens. The results are shown in Figure 3. The percentage showing significant bacteriuria was the same by both methods. The only important difference was that a few specimens obtained by means of the Specitest gave doubtful results and had to be repeated.

The Specitest apparatus has proved to be acceptable and convenient for patients and nurses. While these advantages are most marked with infirm patients, the apparatus should facilitate the collection of satisfactory specimens of urine from all ambulant female patients.

We wish to thank Messrs Armitage Excelsior Ltd and Sister M. T. Hutchings and Miss M. A. Mellings.

REFERENCES

- Brumfitt, W., and Percival, A. (1964). *J. clin. Path.*, 17, 482.
- Fitzgerald, T. B. (1964). *Lancet*, 2, 1158.
- Gillespie, W. A., Linton, K. B., Miller, A., and Slade, N. (1960). *J. clin. Path.*, 13, 187.
- Hart, E. L., and Magee, M. J. (1957). *Amer. J. Nurs.*, 57, 1323.
- Leather, H. M., and Hutchings, M. T. (1960). *Lancet*, 2, 654.
- Turner, G. C. (1961). *Ibid.*, 2, 1062.