Direct microscopy of uncentrifuged urine

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Cell counts on centrifuged specimens of urine are unreliable, inaccurate, and time consuming (Little, 1962, 1965; Stansfelt, 1962; Gadeholt, 1964; More, Hira, and Stirland, 1965). Counting chambers are expensive and inconvenient in use when large numbers of specimens have to be examined. To overcome these objections, modified slide-chamber methods have been described (Hilson, 1964; Mair Thomas, 1971; Petts, 1972). Described here is a method utilizing glass 'well-slides'.

Method

The urine sample is well mixed and 3 drops (≡ 0·1 ml) of undiluted urine pipetted into the well of a 'well-slide'. Those used were described by the manufacturers (Baird and Tatlock) as being 76 × 22 × 1·25 mm ground edges with polished depressions 15 mm diameter approximately 1 mm deep. We found the maximum depth of the depression to be 0·44 and 0·47 mm and the depression diameter between 14 and 15 mm. A coverslip2 (Chance no. 1 22 × 22 mm square and 0·14 to 0·16 mm thick) is placed on top of the filled well and the urine is examined under ×40 objective of a Watson Microsystem 70 microscope with ×10 eyepieces.

The well is scanned and five fields in the area of the centre of the well are counted. The slides are discarded into 2% Hycolin and the following morning washed, rinsed, and dried.

The cells in the urine samples were also counted in parallel in a modified Fuchs Rosenthal counting chamber (depth 0·2 mm). The samples were examined undiluted and enumerated by counting the cells in 80 small squares.

Results

Figure 1 compares results of well slide and counting chamber 0·5–50 cells/mm². Figure 2 compares results of well slide and counting chamber 50–350 cells/mm². It will be seen that there is good agreement in both the ranges between the two techniques.

1 Baird & Tatlock, Freshwater Rd, Chadwell Heath, Essex.
2 Chance Bros, 29 St James Street, London SW1.
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Comment

Preparations are not permanent and are discarded immediately after examination. The specimens of vas deferens are kept until the result of the third postoperative semen examination is known. The question of retaining material for medico-legal purposes does not in our opinion arise any more in the examination of the histology than it does in, for example, the examination of the semen.

Fig Transverse section of vas deferens stained methylene blue × 25.

By the use of this simple technique we calculate that we have saved more than half a day's technician-time per week, a saving of some significance in a histopathology laboratory of district general hospital size.
Comment

The method described gave comparable results with those obtained with the Fuchs Rosenthal counting chamber. It has the advantage that it is cheaper and quicker than using a counting chamber. We think that it is easier to use and at least as accurate as previously described methods (Hilson, 1964; Mair Thomas, 1971; Petts, 1972). It is unnecessary in practice to count the cells greater than 50 per well = 250 cells/mm² because for accuracy it is necessary to dilute the specimen. All the material used is commercially available.

EFFECT OF LEAVING SLIDES ON THE BENCH

It occurred to us that during the routine examination of large numbers of specimens, usually coming in batches of 30 to 40 through the day, the time the ‘well-slide’ remained on the bench might affect the cell count. A number of slides covering the range 0-250 cells/mm² were therefore left on the bench for 60 minutes and were examined every five minutes. There was no variation until after 45 minutes when the urine started to dry up.

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References