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Comparative evaluation of the El Zogabie modification of the Nytrex urine filtration technique for the detection and enumeration of *Schistosoma haematobium* ova

Short communication

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Urine filtration techniques for the detection of *Schistosoma haematobium* ova using filter supports for Nucleopore (Peters et al., 1976), Nytrex (Mott et al., 1982; Mott, 1983) or paper filters (Bradley, 1986) are now recommended.

There have been two adaptations of the Nytrex syringe filtration technique. The El Zogabie modification uses cellophane prepared according to the Kato technique. The cellophane is placed over the Nytrex filter and therefore maintains a semi-permanent record (El Zogabie, 1985). In Malawi, Lugol's iodine solution is used to stain the ova to enhance visualization (Mott, pers. comm.).

This communication reports on the comparative evaluation of these modifications. The laboratory study was designed to compare the effectiveness of (a) Nytrex filter unstained, (b) El Zogabie modification, (c) Nytrex filter stained with Lugol's iodine and (d) EL Zogabie plus Lugol's iodine for detection and enumeration of *S. haematobium* ova.

75 mm lengths of 25 mm wide cellophane were cut from 50 m rolls. These cellophane strips were soaked in (a) 50% glycerine-malachite green solution (100 ml distilled water, 100 ml glycerine and 1 ml 3% aqueous malachite green solution), (b) 50% glycerine solution (100 ml distilled water and 100 ml glycerine) for 2 days before use.

Mid day urine was collected from 134 school children in Dar es Salaam. Sufficient urine was collected to provide at least four 10 ml aliquots for examination by each of the four techniques.

10 ml of the urine was filtered using the syringe filtration technique with a 12 mm diameter Nytrex filter having a 20 micron pore size, mounted on a 13 mm diameter Swinnex filter support. The filter was removed and placed face down on a 75×25 mm glass microscope slide and examined. The second 10ml urine sample from the same urine specimen was filtered, the filter placed on a slide and covered with cellophane soaked in 50% glycerine-malachite green solution and examined. The third 10 ml urine sample was filtered, filter placed on the slide and a drop of Lugol's half strength iodine was pipetted onto the filter and examined. The fourth 10 ml sample was filtered, a drop of iodine pipetted onto the filter and covered with cellophane soaked in 50% glycerine solution and examined.

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All 134 urine specimens were subjected to these four techniques. After examination the slides were returned to slide folders. Four weeks later the slides were reexamined, the ova had maintained their shape. The cover slips were then removed, and filters washed with ordinary soap and water, rinsed several times in clean water and dried for reuse.

Of the 134 urine specimens examined, 65 (48.5%) were found to be positive for *S. haematobium* ova. All four techniques agreed on the positivity of 63 specimens. For two specimens, techniques (a) and (b) showed zero egg counts. The two specimens had an egg count in the range 1 to 6 eggs/10 ml urine. The geometric mean egg count per 10 ml of urine for the total number of children examined by the four techniques were: (a) 13.5 for the Nytrel filter unstained, (b) 13.5 for the El Zogabie modification, (c) 13.8 for the Nytrel filter stained with iodine and (d) 14.5 for the El Zogabie plus iodine. A two way analysis of variance was carried out using the log transformation. Results show there to be no difference between the four techniques (variance ratio 0.445).

Filtration of urine using Nytrel filter and its modifications were shown to be reliable techniques for the detection and quantification of *S. haematobium* ova.

Using half strength Lugol's iodine solution, the ova are much more easily counted. The filter does not stain.

With the El Zogabie modification, the malachite green is taken up intensely by the germinal cells of the miracidia and not by the shell of the ova. Methylene blue may be used in place of malachite green also giving excellent results. In some cases the cellular debris on the filter also picked up the stain and counting became difficult. The El Zogabie preparation is best examined a day or two later, this enables the stain to penetrate fully and therefore enhance visualization of the ova. Glycerine preparations without any stain can also be used although visualization of the ova on the filter is not so distinct but the eggs are preserved.

Excess glycerine from the cover slips may be gently removed with absorbent tissue. Care should be taken when placing the cellophane covers onto filters as air bubbles are likely to be trapped, making the examination difficult. However, a drop of glycerine placed on the filter prior to putting on the cellophane removed the air bubbles.

In large scale epidemiological surveys mounted by national schistosomiasis control programmes, a simple low cost diagnostic technique is necessary. Cost of each Nytrel filter is US \$ 0.01, and it can be reused at least 200–300 times or more if washed in mild detergent or plain soap (Mott et al., 1982). However, the major cost is in the filter support, US \$ 1.70 if purchased individually or US \$ 0.65 in bulk order purchases. All material is reusable. The wettable cellophane is fairly cheap, a 50 m roll costing US \$ 0.45. 2000 examinations can be carried out with three filters on a slide from a single 50 m roll.

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