The Specificity of the Nitromethane-Hyamine Procedure for the Determination of Nitrofurantoin in Urine

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Data show that the presence of certain other antimicrobials in urine does not interfere with the determination of nitrofurantoin by the nitromethane-Hyamine procedure.

Recently, a new analytical method (nitromethane-Hyamine) for the determination of nitrofurantoin (Furadantin*) in urine was presented (1). Occasionally, during nitrofurantoin medication, another antibacterial is administered concomitantly (2–8). Such therapeutic regimen necessitates information regarding the possible interference of other antimicrobials with the determination of nitrofurantoin by the nitromethane-Hyamine procedure.

One milliliter of an aqueous solution containing 50 \( \mu \)g./ml. of each antibacterial examined was subjected to the nitromethane-Hyamine procedure (1). This method consists of the direct extraction of the nonionized form of nitrofurantoin by the use of nitromethane, the addition of an alkaline reagent (Hyamine) to the extract to produce a visible color, and the determination of the nitrofurantoin concentration by spectrophotometry at 400 m\( \mu \). None of the following antibacterial agents exhibited a visible color, suggesting that their presence should not interfere with this analytical procedure: polymyxin B sulfate (Aerosporin), tetracycline hydrochloride (Achromycin), chloramphenicol (Chloromycetin), colistimethate sodium (Coly-Mycin), erythromycin ethyl succinate (Erythrocin), sulfisoxazole (Gantrisin), kanamycin sulfate (Kantrex), methenamine mandelate (Mandelamine), nalidixic acid (NegGram), neomycin sulfate, penicillin G potassium, sodium oxacillin (Prostaphlin), streptomycin sulfate, and oxytetracycline (Terramycin).

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In addition, a solution of each of these antimicrobials was mixed with fresh human urine containing nitrofurantoin at a concentration of 30 \( \mu g./ml \). The concentration for each of the other agents was 50 \( \mu g./ml \). These samples were then analyzed for nitrofurantoin by the nitromethane-Hyamine procedure. The control-corrected absorbance at 400 \( \text{nm} \) for a urine sample containing 30 \( \mu g./ml \) of nitrofurantoin is 0.206. The corrected absorbances obtained for nitrofurantoin in the presence of these antibacterials ranged from 0.204 to 0.210, with an average of 0.207.

The results establish that the presence of the enumerated antimicrobials in the urine does not interfere with the determination of nitrofurantoin by the nitromethane-Hyamine procedure. The possibility that the administration of these agents could result in the formation of metabolic products which might cause interference is to be investigated.

References