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The antibacterial activity of Rowatinex

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Rowatinex is a proprietary mixture of essential oils marketed for a variety of renal disorders, including infection. Urine of volunteers taking Rowatinex exhibited no antibacterial activity against common urinary pathogens, and a protracted course of treatment had no effect on a *Proteus mirabilis* infection of a patient with renal stones. Some urinary bacteria were inhibited *in vitro* by the volatile products of the essential oils, but it appears that the metabolized forms in which the oils are known to be excreted into urine retain no useful antibacterial activity.

Introduction

Rowatinex is a proprietary mixture of essential oils consisting of 31% pinene, 15% camphene, 10% borneol, 4% anethol, 4% fenchone and 3% cineol in an olive oil base. The compound is marketed for a variety of renal disorders, including urolithiasis and urinary infection. Clinical experience suggests that Rowatinex may offer some marginal benefit in promoting the elimination of calculi (Will *et al.*, 1981) but evidence for its efficacy in urinary infection is insecure. Since the oils are excreted into urine in metabolized forms, mainly as glucuronide conjugates and sulphates (Will *et al.*, 1981) any antibacterial activity detected in the native compound may not be reflected in the urine of treated patients.

We have therefore investigated the antibacterial activity of Rowatinex in the native form and in the urine of individuals taking the compound.

Materials, subjects and methods

Rowatinex was supplied by Rowa Ltd., Bantry, Co. Cork, Republic of Ireland.

Seven strains of bacteria were examined: 2 *Escherichia coli*, 3 *Proteus mirabilis* and 2 *Klebsiella aerogenes*. All were urinary isolates.

Undiluted Rowatinex was either pipetted directly into wells cut into Diagnostic Sensitivity Test (DST) agar (Oxoid Ltd) seeded with the test organism, or absorbed into filter paper strips (*c.* 60 × 10 mm) applied to the surface of seeded DST agar plates. Cultures were incubated at 37°C overnight.

Urine samples were collected from three volunteers before and 6 h after taking three capsules of Rowatinex. Samples were also obtained from the three volunteers after taking one capsule four times a day for three days. The dosage is the one

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recommended by the manufacturers for urinary tract infection. Antibacterial activity in the urine was tested by the well diffusion method.

One patient with renal stones and proven *Pr. mirabilis* infection was treated with two capsules twice a day for six months.

Results

Undiluted Rowatinex pipetted into wells in inoculated agar plates failed to inhibit growth of any of the test organisms. However, impregnated filter strips applied to inoculated plates yielded small zones of inhibition (*c.* 2 to 4 mm from the edge of the strip) with five of the seven strains.

To explain this anomaly, it was postulated that the small zone of inhibition was due not to diffusible compound (essential oils are extremely insoluble) but to volatile products present in large concentration in the immediate vicinity of the strip; the small volume of Rowatinex used in the well diffusion test would provide an insufficient concentration of such volatile products.

In order to test this hypothesis, plates were spot-inoculated with about 10^3 colony-forming units of each of the test bacteria and incubated inverted over 1 ml of Rowatinex contained in the lid of the Petri dish, so that the bacteria were exposed only to the vapour of the compound. Growth of the three *Pr. mirabilis* strains and one *Klebsiella* strain was completely inhibited, while growth of the two *E. coli* strains was reduced in comparison to unexposed controls. One *K. aerogenes* strain was unaffected by exposure to the vapour.

When the urine of subjects receiving Rowatinex was tested in well diffusion tests, no inhibitory activity whatsoever could be detected, either in urine collected six hours after a single large dose, or in urine obtained after a three day course of treatment.

Rowatinex had no effect on the *Pr. mirabilis* infection of the patient treated with the compound, and no inhibitory activity could be detected in the patient's urine during therapy either against the infecting organism or any of the other test organisms. After six months' therapy small calculi were still passed and a nephrolithotomy was performed six months after stopping Rowatinex. While taking the capsules the patient complained of heartburn and excessive eructation.

Discussion

Infected renal stones are notoriously refractory to conventional antimicrobial therapy and the potential advantages of a compound that aids the clearance of renal stones and at the same time controls any associated infection, are obvious.

Our findings suggest that Rowatinex possesses some antibacterial activity, but that this activity is restricted to the volatile products of the essential oils.

Since we were unable to detect any diffusible antibacterial activity in the urine of subjects taking Rowatinex, it would appear that the solubilized glucuronides and sulphates that represent the chief metabolic products of the oils in urine (Will *et al.*, 1981) retain no useful activity against infecting bacteria. Similar abolition of antibacterial activity in glucuronide conjugates is well known to occur with, for example, chloramphenicol (Glasko *et al.*, 1949) and nalidixic acid (Stamey, 1971).

References

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