oral cavity have also been demonstrated. (3,4,13,14) On the other hand, the few clinical studies on the effect of 2-methyl-1,4-naphthaquinone incorporated into chewing gum, on caries activity have been contradictory since the decrease in incidence of new carious lesions reported by Burrill and coworkers(15) could not be substantiated by the U. S. Professional Service Schools.(16) Moreover, the previous experimental investigations carried out in rats(17) and hamsters,(2) as well as the present studies, on the effect of quinone derivatives with and without vitamin K activity, in the control of dental caries have all been negative. Therefore, an impartial analysis of the results obtained in clinical and experimental studies on this subject, demonstrate that vitamin K active compounds or other quinone derivatives do not show any promise of controlling caries, and therefore the use of these compounds as a control measure against human dental caries should be discouraged. Certain previous suggestions on the possible beneficial effect of vitamin K in the control of caries(18) were the product of theoretical considerations which have not been substantiated by actual experiments.

Summary. Further studies on the effect of different quinone derivatives with varying degrees of acid-formation inhibiting power, as determined *in vitro,* and with or without vitamin K activity, on dental caries activity were carried out in hamsters. In these studies the following quinone derivatives were tested: Dicalcium salt of methylnaphthohydroquinone diphosphate, methylnaphthohydroquinone disuccinate, anthraquinone sulphonic acid, and dichloronaphthoquinone. The compounds were used in higher amounts than those used in the previous experiment.

The results showed that none of the quinone derivatives tested exerted beneficial effect against dental caries activity, as compared with the control group. Thus the present experiment confirms the negative findings of previous studies, clinical as well as experimental, on this subject, and indicates that the use of vitamin K active compounds or other quinone derivatives as a control measure against human dental caries should be discouraged. Furthermore, some other implications of these studies have been discussed.

13. Alcalay, W., *Schweiz. Z. f. Path. und Bakt.*, 1947, v10, 229.

14. Kavanagh, F., *J. Bact.*, 1947, v54, 761.

15. Burrill, D. Y., Calandra, J. C., Tilden, E. B., and Fosdick, L. S., *J. D. Res.*, 1945, v24, 273.

16. Professional Service Schools, Medical Department, Washington, D.C., U.S.A., Bull. U. S. Army Med. Dept., 1946, v5, 265.

17. Hatton, E. H., Dodds, A., Hodge, H. C., and Fosdick, L. S., *J. D. Res.*, 1945, v24, 283.

18. Fosdick, L. S., *J. D. Res.*, 1948, v27, 235.

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The Treatment of *Trichomonas vaginalis* Vaginitis with Aureomycin. (17538)

LEON V. MCVAY, RAYMOND L. LAIRD, JAMES B. FLANAGAN AND DOUGLAS H. SPRUNT

From the Divisions of Medicine, Preventive Medicine, and Pathology and Bacteriology, University of Tennessee College of Medicine, and The John Gaston Hospital, Memphis.

Since we(1) had been successful in treating amebiasis with aureomycin it was thought possible that this antibiotic might be useful in other parasitic infestations. It was recalled that many amebicidal preparations are effective against *T. vaginalis.* Subsequent *in vitro* studies revealed that aureomycin is likewise trichomonicidal. Therefore, it was decided to investigate the action of the local application of aureomycin into the lower female genital tract in *T. vaginalis* vaginitis. A powder for vaginal insufflation was prepared by adding

1. McVay, L. V., Laird, R. L., and Sprunt, D. H., *Science,* 1949, v109, 590.

aureomycin hydrochloride to powdered talc (U.S.P. Merck). The first 6 patients were treated with talc alone. In each of these cases the vagina was insufflated with 2 g of powdered talc on 2 consecutive days and again on the fourth day. At the end of this period the vaginal secretions were negative for *T. vaginalis* in all 6 cases. Three days following cessation of therapy, the vagina contained *T. vaginalis* in 5 of the 6 cases. In the sixth patient vaginal secretions did not become positive until the eighth day. The leukorrhea and vaginal inflammation had persisted.

Aureomycin in dosages of 2 grams a day for 7 days by mouth has been ineffective in the treatment of this condition. Through the cooperation of the Medical, Gynecological, and Obstetrical Services of the John Gaston Hospital 54 case of *T. vaginalis* vaginitis were obtained for treatment. Twelve of these patients were pregnant and were referred for treatment by the Obstetrical Service. The diagnosis in each case was established by the demonstration of the organism microscopically in the wet-mount preparation.

The preparation for each vaginal insufflation consisted of 500 mg of aureomycin and 2 g of powdered talc. A Holmes insufflator equipped with a rubber cuff and detachable end-piece was employed. The preparation was sprayed evenly over the cervix, vagina, introitus and vulva. Following each treatment patients were instructed to wear a vulvar pad until the next treatment and to refrain from douches or intercourse.

Thirty-one symptomatic non-pregnant patients and 11 asymptomatic non-pregnant patients were insufflated as described above on the first, second, fourth, and sixth days of therapy. Following this the patient was instructed to insert one 250 mg gelatin capsule of aureomycin every other night deep into the vagina for 2 weeks. Twelve symptomatic pregnant patients were similarly insufflated on the first, second, third, fourth, sixth, and eighth days of treatment. Subsequently a 250 mg capsule of aureomycin was inserted each night for 2 weeks. Of the 31 symptomatic, non-pregnant cases there was objective evidence of relapse or reinfection but no return of symptoms in 3 cases. These 3 patients were subsequently retreated successfully. There were no recurrences among the 11 asymptomatic non-pregnant women treated. The rapid subjective and objective improvement of the pregnant cases was most gratifying. These patients were treated more vigorously than the others since it is well established that the disease is much more stubborn to any form of therapy during pregnancy. Three of the 12 pregnant cases showed evidence of reinfection or relapse following therapy, but in only one was there a return of symptoms. This last patient was extremely resistant to treatment and responded only after 3 courses of therapy. All of the 54 patients have been followed at biweekly intervals for 2 to 3 months since stopping treatment.

No significant toxic reactions to intravaginal aureomycin were noted. In 9 of 54 cases mild discomfort, as pruritus, burning or mild intravaginal pain was experienced. This usually occurred after the first or second application of aureomycin and could not always be definitely attributed to the drug. There was no demonstrable adverse effect on pregnancy. It is noteworthy that no objective evidence of local tissue reaction to aureomycin could be demonstrated on physical examination. Moreover, there is no need for concern over any cumulative effects of aureomycin as contrasted to the arsenicals since the small quantities of the drug absorbed from the vagina are rapidly excreted in the urine and bile. Blood levels of aureomycin (done in only 2 cases) 3 hours after vaginal insufflation of 500 mg in talc were in the neighborhood of 0.12 μg per cc of blood. Twelve of the cases in this series have been followed by approximately 6 months. In only 2 have trichomonads reappeared.

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