generalized distension of the abdomen, with dullness on percussion corresponding to that of an ascites instead of an ovarian cyst. In addition a fluid thrill could be elicited. Pain and tenderness were unabated, however, and laparotomy seemed imperative.

Half an hour later the patient was anaesthetized, though the induction was difficult owing to the vomiting of dark "coffee-ground" material. The stomach was emptied with a stomach-tube, after which there was less difficulty. A metal catheter was passed into the bladder and another 6 oz. (170 ml.) of clear urine obtained. On bimanual vaginal examination no pelvic abnormality could be found apart from the large involuting uterus. A fluid thrill was still clearly present, however.

The abdomen was opened by a midline subumbilical incision, and immediately a straw-coloured odourless fluid began to flow out. Six pints (3.4 litres) of this was removed with the sucker and the rest mopped out with gauze until a clear view of the abdominal contents could be obtained. The uterus was pale and normal in size for this stage of the puerperium, while the small bowel and omentum were also of normal appearance. Both ovaries and tubes were inspected and found to be normal. The upper abdomen was explored with a hand, and nothing abnormal was discovered. More by good fortune than design, the uterus was pushed backwards and the utero-vesical pouch examined, and there in the fundus of the bladder was a hole big enough to admit one or two fingers; its edges were necrotic and gangrenous.

The necrotic edges were cut away and the hole was repaired by continuous sutures in two layers. An assistant introduced a Malecot self-retaining catheter into the bladder, via the urethra, before the abdomen was closed, to safeguard against further injury to the sutured fundus. A little remaining fluid was mopped out of the peritoneal cavity, and the abdomen closed without drainage. The patient's general condition was not very good, and an intravenous saline drip transfusion was started and a Ryle's tube left in the stomach. A pint (570 ml.) of blood was transfused a few hours later. The bladder was allowed to drain into a Winchester bottle. Penicillin, 200,000 units, was given three-hourly.

The post-operative course was impaired at first by a troublesome cough with a purulent sputum, though there was only slight pyrexia. Some intestinal distension developed, but spontaneous passage of flatus occurred on the third day, when the drip was discontinued. The Ryle's tube had been removed the day after operation. An enema was now given, and flatus resulted. By the fifth day the patient was eating a light diet, and sulphamezathine, 0.5 g. four-hourly, was started. The catheter was removed on the ninth day, and micturition was immediately possible, though in small quantities at a time. Estimation of residual urine in the morning and evening showed 25 oz. (710 ml.) in the bladder at first, though this gradually diminished to a few ounces by the fourteenth day, when further catheterization was considered unnecessary. Ambulation had been allowed as soon as the catheter was removed. Sulphamezathine was continued until the residual urine had disappeared. The patient was discharged from hospital on the eighteenth post-operative day.

Comment

Spontaneous intraperitoneal rupture of the bladder in the puerperium is an extremely rare event, and no record of any other case can be found, except one in which manual expression of the placenta was being attempted on the fifth day. There is therefore little to be learnt from such an occurrence, though it may be pertinent here to make the following remarks: (1) Palpation of the involuting uterus is still an important part of the after-care of the puerperal patient. Delay in the descent of the fundus is often an indication that the bladder is not

being emptied completely, and that residual urine is collecting. (2) Early ambulation is probably the best means of ensuring that a patient empties her bladder completely.

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AUREOMYCIN AND CHLORAMPHENICOL IN CHANCROID

BY

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Reports concerning the action of "aureomycin" and chloramphenicol on chancroid have been somewhat conflicting. Thus, Wetherbee *et al.* (1949), who tested streptomycin, aureomycin, and a number of other antibiotics *in vitro* against *Haemophilus ducreyi*, thought that aureomycin had only a transitory effect, and that of the drugs tested only streptomycin was likely to be of value for soft sore. Nell and Hill, quoted by Robinson (1950), likewise found the inhibitory effects of aureomycin inferior to penicillin, but stated that chloramphenicol was effective. Working on the human infection, however, Zheutlin and Robinson (1950) reported three clinical cases successfully treated with 2 g. of aureomycin daily for 7-14 days, while Greenblatt *et al.* (1950) recorded yet another case. On the other hand, the latter workers believe that 5-10 g. of chloramphenicol is necessary.

The present work was undertaken in Africa during 1949, on both experimental and clinical infections.

Experimental Infection

An intradermal inoculation of 0.05-0.1 ml. of fluid aspirated from chancroidal buboes was given either to the patients themselves or to other volunteers. If both the donor and the recipient are untreated a local pustule develops within 48-96 hours and proceeds to chancroidal ulceration. If the recipient is treated with effective drugs at the time of inoculation, or the donor before inoculation, no such reaction occurs. Three series of experiments have been described (Willcox, 1950a, 1950b, 1950c), referring respectively to (1) the auto-inoculation of the donors; (2) the hetero-inoculation of volunteers treated with material from untreated donors; and (3) the hetero-inoculation of volunteers with material taken from treated donors 24 hours and later after the beginning of treatment.

Chloramphenicol.—Bubo fluid from Case 1 (see below), proved virulent by injection into an untreated volunteer, was injected into the patient himself, who then received 250 mg. of chloramphenicol orally three times daily for three days. A local bump was evident at 48 hours and persisted until 120 hours, when it was needled but found not to contain pus. Bubo fluid from this donor was also inoculated into five other men 24-48 hours after the treatment had begun, and all failed to show a take, thus indicating that the fluid had lost its virulence. Four others, who received inoculations with

material of proved virulence taken from three untreated donors, were given between seven and twelve 250-mg. capsules of chloramphenicol orally over three to five days. None of these showed a take, although takes were observed in five out of six controls inoculated with the same material.

Aureomycin.—Case 3 was inoculated with his own bubo fluid, which produced three takes out of three in untreated controls, prior to treatment with 2 g. of aureomycin given orally over three days. The arm showed a local bump at 24–96 hours, at the end of which time it was needed but contained no pus. At seven days, however, an ulcer had formed, but it seemed that the ulceration was delayed by the use of the drug. Bubo fluid from this patient was inoculated into 13 others 24–120 hours after the onset of treatment; there was a take in only one (inoculated at 24 hours), and twelve showed no reaction. In addition hetero-inoculations, from four donors whose bubo fluid had produced 15 takes in 17 untreated controls, were made into ten persons, who were immediately given aureomycin orally, the dosage amounting to 500–1,250 mg. over two to four days. There was no take in any.

Clinical Infection

Three cases are reported—two treated with chloramphenicol and one treated with aureomycin.

Case 1.—A young male African negro presented with a fraenal soft sore, with a tender ripening left bubo of two weeks' duration. There was a history of sexual exposure seven days before the onset. Repeated dark-field examinations for *Treponema pallidum* were negative, as was the serum test for syphilis. The Dmelcos skin test for chancroid was, however, positive. He was then treated with 250 mg. of chloramphenicol orally three times daily for three days. The sore was noted to be healing by the second day, by which time the inguinal gland was no longer tender. The sore had completely healed by the fifth day, but the gland required aspiration.

Case 2.—A young male native of Southern Rhodesia attended with a rosette of preputial soft sores of 18 days' duration, but without enlargement of the inguinal glands. Three consecutive daily dark-field examinations were negative for *T. pallidum*, but the serum Wassermann reaction was positive, as was the Dmelcos skin test. He was considered to be a latent syphilitic with superadded chancroid. Two days before treatment this patient had acted as a control in another series of experiments and exhibited an arm pustule in addition. He was given a total of 2,000 mg. of chloramphenicol orally in eight-hourly doses over three days, and by the end of this time the penile sores had entirely healed, but the arm pustule proceeded quietly to a non-angry ulceration before ultimately healing without other measures.

Case 3.—A young male negro from Portuguese East Africa had multiple soft sores of the prepuce, with bilateral fluctuant inguinal buboes, of five days' duration. There had been an exposure two days before this. Repeated dark-field examinations were negative for *T. pallidum*; the serum Wassermann reaction was negative, but the Dmelcos skin test was positive. He was given a total of 2,000 mg. of aureomycin orally over three days. The penile sores healed within four days, but the right bubo required aspiration (15 ml. of avirulent fluid being removed on the fourth day), while the left leaked spontaneously. All was normal by the fifth day.

Discussion

In European and American clinics drugs which have no action on *T. pallidum*—for example, the sulphonamides—together with a proper follow-up, are rightly preferred for the treatment of chancroid, lest an early

concomitant syphilitic infection be masked. Both aureomycin (O'Leary *et al.*, 1948; Irgang and Alexander, 1949; Willcox, 1949) and chloramphenicol (Romansky *et al.*, 1949; Willcox, 1950d), like penicillin, have been shown to have a healing action upon the lesions of early syphilis, as has terramycin and also, to some extent, streptomycin (Willcox, 1950e). Thus in well-developed communities, although penicillin, aureomycin, and chloramphenicol are all effective against soft sore, their antisiphilitic action limits their use to those cases in which resistance to sulphonamides is evident, or when phagedaena occurs and the risk of masked syphilis is small against that of threatened loss of part or all of the member.

In Africa, however, the conditions are somewhat different, especially in facilities for accurate diagnosis and follow-up, which are often virtually non-existent. It is therefore not unreasonable to treat all cases of penile sore in the African with the routine employed for syphilis, provided that the drug given is effective also against chancroid. Penicillin is very suitable, and many workers—for example, Moore (1949)—consider that its place in the treatment of syphilis is still secure. It seems likely that the single injection of 2,400,000 units of procaine penicillin with 2% of aluminium monostearate, which gives results in early syphilis almost as good as those obtained with eight daily injections of 600,000 units (Bauer *et al.*, 1950), and is at the same time reasonably effective against soft sore (Willcox, 1950f), is the optimum routine treatment for genital sores under African conditions.

Although the oral antibiotics have all the medical drawbacks of penicillin in the treatment of chancroid, the fact that they are given orally may prove a blessing in the bush, where administration may be effected, under supervision, by unskilled persons. The same fact is viewed with concern by physicians in more civilized countries, who rightly fear indiscriminate and improper treatment by quacks, or by the patients themselves, without even the certainty, as with penicillin, that the patient has actually received the dose prescribed.

Summary

Experiments in which volunteers were inoculated with chancroidal bubo fluid indicated that both aureomycin and chloramphenicol were capable of preventing the experimental infection in man, and also in rendering the bubo fluid avirulent.

Two clinical cases of soft sore were successfully treated with chloramphenicol and one with aureomycin, although fluctuant buboes still required aspiration.

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