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TREATMENT OF GONORRHOEA WITH AQUEOUS BENZYL PENICILLIN PLUS PROBENECID

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Abstract. An analysis is presented of 428 out-patients with gonorrhoea (237 males and 191 females) treated at the University Department of Dermatology and Venereology, Rigshospitalet, Copenhagen. The treatment with aqueous benzyl penicillin 5 megaunits plus 1 g probenecid gave 97% primary cures while the former treatment with 1 megaunit aqueous benzyl penicillin plus 1.2 megaunits aqueous procain penicillin gave 91% primary cure.

In the evaluation of recent treatments of gonorrhoea attention has mainly been directed towards the sensitivity pattern of Neisseria gonorrhoea. Studies in Greenland by Olsen & Lomholt (8, 9) showed an increasing sensitivity to penicillin. These authors suggested that their results were due to the optimal cure rate which they had obtained with penicillin plus probenecid. The present paper reports on the results of two different types of penicillin treatment for gonorrhoea in patients followed at the University department of skin and venereal diseases (Rigshospitalet) in Copenhagen.

MATERIAL AND METHODS

The study comprises all out-patients treated for gonorrhoea in the year of April 1968 to March 1969, i.e. a total of 428. The diagnosis was made by microscopy of smears and/or culture. The collection of swabs followed the description by Schmidt et al. (11).

Sensitivity testing of the isolated gonococci was made at the Neisseria Department, State Serum Institute, Copenhagen, by a plate dilution method (10). The age distribution of the 237 male and 191 female patients is shown in Fig. 1.

Treatment and follow-up

Until June 1, the routine treatment was a combination of 1 megaunit of aqueous benzyl penicillin and 1.2 megaunits of aqueous procain penicillin.

The standard treatment after June 1, 1968, was a combination of aqueous benzyl penicillin 5 megaunits and probenecid 1 g (i.e. 4 tablets of 250 mg). Probenecid was given per os 30 min prior to intramuscular injection of penicillin.

Patients who had a history of penicillin intolerance received tetracycline 2 g daily for 2 days. If there was any suspicion of concomitant syphilis infection the treatment was duostreptomycin 1 g intramuscularly for 2 days (Table I). Three patients were treated by other venereologists, and one could not be contacted.

Eight females and 10 males were treated for re-infection, 3 females for two re-infections. Forty-four men and 27 women were married, while 193 men and 164 women were unmarried. The number of sexual contacts appears in Table II. Twenty-one men were homosexual, 6 bisexual. Serological tests for syphilis were carried out on all patients.

Eleven patients who had propagation and distant complications received treatment over longer periods. The rate of complications was 3%. Four females had salpingitis; 3 males prostatitis; 1 prostatitis, arthritis, and conjunctivitis.

We distinguish between relapses and re-infections according to Gundersen et al. (3), who considered a case as relapsed if gonococci were demonstrated at the first follow-up visit, and the urethral discharge was unchanged or only temporarily reduced. A case was classified as re-infection if a positive culture was found after a previous negative culture, or sexual intercourse during the follow-up period was admitted.

RESULTS

Fig. 2 shows the sensitivity pattern of the gonococcal strains. The same distribution as described by Nielsen is recognized (7). Table III shows the sensitivity to penicillin of the isolated gonococcal strains and the number of primary cures after treatment with either aqueous benzyl penicillin 1 megaunit plus aqueous procain penicillin 1.2 megaunits or aqueous benzyl penicillin 5 megaunits plus probenecid 1 g.

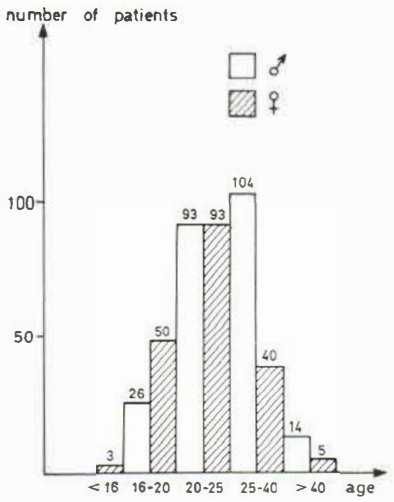

Fig. 1. Age distribution of patients.

The group treated with 1 megaunit of aqueous benzyl penicillin plus 1.2 megaunits of aqueous procain penicillin consisted of 57 patients, 6 of whom were not followed up. Of 5 relapses (9%) all 5 strains had a decreased sensitivity.

Of 341 patients treated with 5 megaunits of aqueous benzyl penicillin and 1 g probenecid 19 were not followed up. Eleven, or 3.4%, relapsed.

Table I. *Distribution of medical treatment*

	♂	♀
Aqueous benzyl penicillin 5 megaunits + 1 g probenecid	186	155
Aqueous benzyl penicillin 1 megaunit + aqueous procain penicillin 1.2 megaunits	33	24
Tetracycline	7	10
Duostreptomycin	8	2
Various combinations of antibiotics	13	10
No treatment		4

Table II. *Sexual contacts of patients*

	Number of sexual contacts					
	1	2	3	4	>4	Not listed
Men						
Married	18	20	2	1	3	0
Unmarried	115	54	7	5	6	6
Women						
Married	24	3	0	0	0	0
Unmarried	81	48	16	3	8	8

None of these had changes of the sensitivity patterns of the isolated gonococcus strains since the first infection. Eleven of 14 patients classified as re-infections admitted sexual intercourse during the follow-up period. Three patients had negative culture at the first control after treatment while positive at the second control. These were also considered re-infected. Erythema due to penicillin was seen in one patient. One man and one woman among the relapses were infected with penicillin-sensitive gonococci. The male patient's contact was not treated until after the first positive control culture was found. The female patient had had many contacts, but denied sexual intercourse during the observation period.

Ten men and 13 women had positive cultures only from the rectum. The strains showed different sensitivity patterns, but there were no relapses among these patients.

All patients were advised to come to renewed syphilis serology control 3 months after treatment. Of 185 who appeared, none had positive reactions (4).

DISCUSSION

The difference between relapses in the group treated with 5 megaunits aqueous benzyl penicillin plus 1 g probenecid and those in the group treated with 1 megaunit of aqueous benzyl penicillin plus 1.2 megaunits of aqueous procain penicillin is not statistically significant. The relapses were found

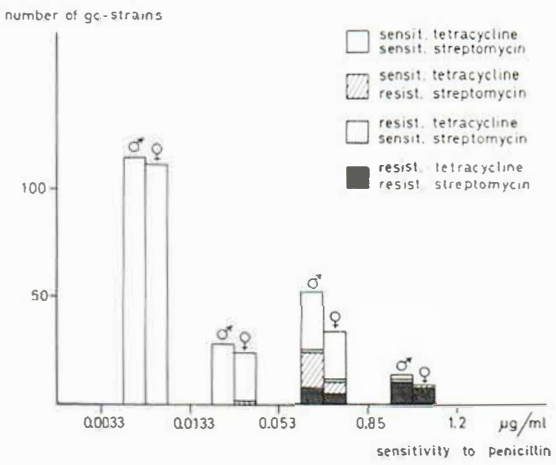

Fig. 2. Sensitivity pattern of gonococcal strains to penicillin, tetracycline, and streptomycin.

Table III. *Comparison between aqueous benzyl penicillin 1 megaunit + aqueous procain penicillin 1.2 megaunits and aqueous benzyl penicillin 5 megaunits + probenecid 1 g*

	Aqueous benzyl penicillin 1 megaunit + aqueous procain penicillin 1.2 megaunits					Aqueous benzyl penicillin 5 megaunits + probenecid 1 g				
			Followed — up					Followed — up		
				Gc. pos					Gc. pos.	
	No. of patients	Not followed up	Gc. neg.	Relapse	Re-infect.	No. of patients	Not followed up	Gc. neg.	Relapse	Re-infect.
Men, μg pc/ml										
0.85 –1.2	3	0	0	3	0	8	0	6	2	0
0.053 –0.85	2	0	2	0	0	42	2	37	2	1
0.0133–0.053	2	0	2	0	0	25	1	23	1	0
0.0033–0.0133	1	0	0	0	1	101	3	97	0	1
	8	0	4	3	1	176	6	163	5	2
Women, μg pc/ml										
0.85 –1.2	2	0	0	2	0	5	1	2	2	0
0.053 –0.85	0	0	0	0	0	27	0	22	3	2
0.0133–0.053	0	0	0	0	0	22	3	18	1	0
0.0033–0.0133	4	1	3	0	0	96	7	83	0	6
	6	1	3	2	0	150	11	125	6	8
Not sensitivity tested										
Men	25	3	21	0	1	10	1	8	0	1
Women	18	2	15	0	1	5	1	4	0	0
	43	5	36	0	2	15	2	12	0	1
Total	57	6	43	5	3	341	19	300	11	11

among the patients infected with gonococci which were less sensitive to penicillin (6). The patients with the least sensitive gc. strains in the group treated with the low penicillin dose all relapsed.

The patients in our study had the same relative distribution of age and sex as was seen in all Denmark and which was also reported by Swedish authors (2, 5). The complications were fewer than reported from other studies (2).

The treatment of patients with a positive culture from the rectum presented no special problems, in contrast to what was reported by Brundin et al. (1). No relapses were found in our group.

All attempts to find the sexual partners of the patients were carried out by an experienced social worker. We found between one and two contacts per patient, on average.

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