A COMPARATIVE STUDY OF AMOXYCILLIN AND AQUEOUS PROCAINE PENICILLIN G IN THE TREATMENT OF WOMEN WITH GONORRHEA

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SYNOPSIS

Two hundred and three women with bacteriologically proven gonorrhea were divided into two equal groups, one of which was treated with aqueous procaine penicillin G in standard doses and the other with amoxycillin as a single oral 3 gram dose. The cure rate was high in both series and the advantage of amoxycillin was that it can be given by mouth and it had no side effects in this series. Amoxycillin is considered to be highly effective for treating gonorrhea in females.

INTRODUCTION

Amoxycillin ("Amoxal" — Beecham) is a semisynthetic penicillin which differs only slightly in its structure from ampicillin. However, the advantages of amoxycillin are that (a) it gives twice the blood levels of an equivalent dose of ampicillin; (b) its absorption does not appear to be affected by food in the stomach; (c) 8-hourly doses maintain effective blood levels compared with 6-hourly doses of ampicillin; (d) side effects such as diarrhea and rashes are lower with amoxycillin than with ampicillin. A range of organisms, both gram-negative and gram-positive, were sensitive to amoxycillin, including a **Neisseria gonorrhea.** Amoxycillin has already been shown to be highly effective against gonorrhea in males in a Brisbane trial (Smithurst, 1974) and in this present report, data are presented on its efficacy in the treatment of gonorrhea in females.

The world-wide emergence of strains of **Neisseria gonorrheae** which are relatively resistant to benzyl-penicillin G given in quite high doses and combined with probenecid (Willcox, 1972) has prompted the search for other effective antibiotics to treat the epidemic infection gonorrhea. Ampicillin in single doses of up to 3.5 gm and combined with probenecid has been used to treat gonorrhea, particularly in Asia (Kvale et al, 1971) although smaller doses were effective in Europe in trials (Gundersen et al., 1969). Research has been carried out to

find an orally administered antibiotic which will maintain a higher sustained blood level. Recently, Beecham Laboratories have produced a semi-synthetic penicillin, amoxycillin (a-amino-p-hydroxy benzyl-penicillin), which is comparable to ampicillin in antibacterial activity, but which has the advantages already enumerated. Organisms which respond to amoxycillin include penicillin-sensitive strains of Staphylococcus aureus, streptococci and pneumococci, strains of Haemophilus influenzae and most strains of Escherichia coli, Proteus mirabilis, Shigella sonnei, Salmonellae and Streptococcus faecalis. The level of amoxycillin which inhibits these strains varies from 0.01 ug/ml to 5.0 ug/ml. Penicillinase-producing Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella and enterobacteria do not respond to amoxycillin (Sutherland et al., 1972).

MATERIALS AND METHOD

A total of 203 women with bacteriologically proven gonorrhea at the Women's Clinic, Brisbane, were divided into two groups and were treated with either 3.0 gm amoxycillin in a single oral dose or aqueous procaine penicillin G 4.8 megaunits, given by intramuscular injection, plus 2.0 gm probenecid by mouth. After the diagnosis of gonorrhea was made by gram stain of cervical and urethral smears, and cultures from both orifices on Thayer-Martin medium, the patients were allotted week about to either the amoxycillin or the penicillin group. The routine at the Women's Clinic is to follow patients for three weeks with weekly smears and cultures from the urethra and cervix. It is the experience at the clinic that it is the exception rather than the rule for patients to return for this regular follow-up and that they come back, if at all, at irregular intervals.

RESULTS

TABLE 1 Age Distribution of Patients

	Number of Patients	
Age (Years)	Amoxycillin Group	Procaine Penicillin G Group
10 — 19	50	58
20 — 29	43	35
30 — 39	4	3
40 — 49	5	4
50 — 59	0	1
TOTAL	102	101

TABLE 2 Age at First Intercourse

	Number of Patients	
Age (Years)	Amoxycillin Group	Procaine Penicillin G Group
12 & Under	3 (1 at 6 years)	1
16 & Under	44	51
20 & Under	47	42
24 & Under	5	2
Over 24	1	1
Unknown	2	4
TOTAL	102	101

TABLE 3 (i) Symptoms Reported by Patients

	Number of Patients	
Symptoms	Amoxycillin Group	Procaine Penicillin G Group
Nil	52	64
Pelvic/abdominal pain	4	3
Discharge	41	29
Dysuria	17	10

(ii) Clinical Findings

	Number of Patients			
Signs	Amoxycillin Group		Procaine Penicillin G Group	
Nil	44		41	
Discharge	Creamy	Purulent	Creamy	Purulent
Excess	3	2	0	2
Moderate	8	10	17	12
Slight	24	7	20	7
Lymphadenopathy	10		4	

TABLE 4 Duration of Illness*

Duration (Days)	Number of Patients	
	Amoxycillin Group	Procaine Penicillin G Group
Unknown	51	56
3 days or less	7	16
4 — 6 days	3	5
7 — 13 days	21	6
14 — 20 days	9	7
21 — 28 days	2	4
1 month +	9	7
TOTAL	102	101

*Based on symptoms or contact which may have caused the infection.

TABLE 5 Sensitivity of Organisms to 0.1 International Units/ml Penicillin or Less

Sensitivity	Number of Patients	
	Amoxycillin Group	Procaine Penicillin G Group
Sensitive	73	86
Relatively resistant	24	11
Failed culture for sensitivity testing	5	4
TOTAL	102	101

DISCUSSION

The two groups of patients were comparable in age and in size of group studied. In both the amoxycillin treated group and in the penicillin treated group the results on follow-up showed a high rate of cure. The great majority of patients returned for two repeated smears and cultures. As venereologists usually hold that three repeated smears and cultures are necessary, 100 per cent success for both regimes cannot be claimed. There were no side effects in either the amoxycillin or penicillin treated group. Amoxycillin has the advantages of administration by mouth, a high sustained blood level and relative freedom from toxicity and it is now the standard treatment for gonorrhea at the female venereal disease clinic in Brisbane.

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TABLE 6 Duration of Follow-up After Treatment

Duration (Days)	Number of Patients	
	Amoxycillin* Group	Procaine Penicillin G Group
0 — 9	6	10
10 — 19**	29	25
20 — 29	44	38
30 — 39	16	25
40 — 49	5	3
50 — 59	1	—
60 — 69	—	—
70 — 79	—	—
80 +	1	—
TOTAL	102	101

*Based on symptoms or contact which may have caused the infection.

*Two patients in the amoxycillin group were found on follow-up to be positive for N. gonorrhea. Both admitted to further intercourse and in both cases the organism was different on sensitivity testing. These cases were considered to be reinfections. No patients in the penicillin treated group were positive for N. gonorrhea after treatment.

**Patients in the groups 10 — 19 days reported once or twice only for follow-up smears and cultures.

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