ORAL ADMINISTRATION OF PHENOXYMETHYL PENICILLIN (DISTAQUAINE V)

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The oral administration of penicillin has many advantages, and a number of reports have been published on various preparations. In all of these absorption was found to be very irregular, large dosage being required to maintain satisfactory blood levels. (Wright *et al.*, 1953; Fairbrother and Daber, 1954; Cathie and MacFarlane, 1953; Doxidis *et al.*, 1951.) In order to provide more reliable absorption, Phenoxyethyl Penicillin ('Distaquaine V') has recently been introduced in this country. Although it has been in use on the Continent (Brandl *et al.*, 1953), no reports have yet appeared in the English literature. This paper gives the results of a limited survey of serum penicillin levels after the oral administration of 'Distaquaine V' to three patients and 12 normal subjects whose ages ranged from 18 - 47 years.

Method

The tablets contain 60 mg. 'Distaquaine V' (approx. 100,000 units) and each subject had blood estimations performed after the ingestion of 1, 2 and 4 tablets. The dose was given well before the mid-day meal and blood was withdrawn at hourly intervals, the serum being separated as soon as possible and the titration carried out on the same day. The serum penicillin levels were estimated by a serial dilution method using Glucose Andrade peptone water inoculated with one drop of an overnight broth culture of the Oxford strain of *Staphylococcus aureus* (sensitive to 0.02 units of penicillin per c.c.). Readings were taken after incubation for 18 hours at 37°C. and the end point was based on colour change and visible growth, both being compared with a control of normal serum containing a known amount of penicillin.

In some instances it was found necessary to sub-culture on to a solid medium to ascertain the end-point.

Results

The serum penicillin levels obtained are shown

in Tables 1—3 and Figs. 1—3. Fig. 4 is a graph of the average levels for all three doses.

SUBJECT	HOURS			
	1	2	3	4
G.W.	.16	.08	.08	.04
A.L.	.08	.08	.08	.04
M.J.M.	.08	.08	.04	.04
L.H.	.16	.08	.04	.04
M.A.B.	.32	.08	.04	.04
A.C.A.	.16	.08	.04	.04
E.T.	.64	.04	—	—
A.R.T.	.16	.08	.04	—
A.E.J.	.32	.08	.04	—
P.J.D.	1.28	.16	.04	—
A.T.	.16	.08	.08	.08
N.C.B.	.04	.08	.16	.16
AVERAGE LEVELS	.3	.08	.06	.04

TABLE 1. Serum Penicillin levels (units/c.c.) in 12 normal subjects after administration of 100,000 units of Distaquaine V.

SUBJECT	HOURS					
	1	2	3	4	5	6
G.W.	.64	.16	.04	.04	.04	—
A.L.	.32	.16	.08	.08	.08	.04
M.J.M.	.64	.32	.08	.04	—	—
L.H.	.64	.16	.08	.04	—	—
M.A.B.	.64	.32	.08	.04	—	—
A.C.A.	.64	.32	.08	.04	—	—
E.T.	2.56	.16	.04	—	—	—
A.R.T.	.64	.16	.08	—	—	—
A.E.J.	.16	.64	.32	.16	—	—
P.J.D.	1.28	.32	.08	—	—	—
A.T.	.16	.32	.16	.08	—	—
N.C.B.	.64	.64	.16	.08	—	—
AVERAGE LEVELS	.75	.3	.1	.05	.01	—

TABLE 2. Serum Penicillin levels (units/c.c.) in 12 normal subjects after administration of 200,000 units of Distaquaine V.

SUBJECT	HOURS					
	1	2	3	4	5	6
G.W.	1.28	1.28	1.28	.32	.08	.04
A.L.	2.56	.64	.32	.08	.04	—
M.J.M.	1.28	1.28	.32	.08	—	—
L.H.	1.28	.32	.16	.08	—	—
M.A.B.	2.56	.64	.32	.08	—	—
A.C.A.	2.56	1.28	.32	.16	—	—
E.T.	5.12	.64	.16	.04	—	—
A.R.T.	2.56	.32	.32	.08	.04	—
A.E.J.	—	2.56	1.28	.64	.16	.08
P.J.D.	5.12	1.28	.16	.04	—	—
A.T.	.64	1.28	.64	.16	.08	.04
N.C.B.	.32	1.28	.64	.64	.32	.16

AVERAGE LEVELS	2.1	1.0	.49	.2	.06	.02
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TABLE 3. Serum Penicillin levels (units/c.c.) in 15 normal subjects after administration of 400,000 units of Distaquaine V.

These levels are uniformly higher than those obtained with other preparations of penicillin, but even so, extreme individual variation was still encountered. This can be seen from Table 3 where, one hour after a dose of 4 tablets, levels ranged from nil to 5.12 units per c.c. Individual variation was also noted, and in the case of one

FIG. 1

FIG. 2

FIG. 3

FIG. 4

subject (A.E.J.), the peak level was progressively delayed, the 1-hour levels decreasing as the dose was increased. However, in view of the levels obtained and their duration, it was felt that the preparation was satisfactory for clinical use. In order to demonstrate any cumulative effect, daily estimations were performed on three patients receiving 2 tablets 6-hourly. Each day for three days blood was taken immediately before the mid-day dose and again at 1.0 p.m. The results are shown in Table 4 and probably represent individual variation rather than a cumulative effect.

PATIENT	1st Day.		2nd Day.		3rd Day.	
	12.0 noon	1.0 p.m.	12.0 noon	1.0 p.m.	12.0 noon	1.0 p.m.
1.	.08	.64	Nil	.32	Nil	.64
2.	.08	.32	.04	1.28	.04	1.28
3.	Nil	.64	Nil	0.64	Nil	1.28

TABLE 4. Serum Penicillin levels (units/c.c.) in patients receiving 200,000 units Distaquaine V 6 hourly. Estimations performed before the midday dose and 1 hour later.

Side Effects

Three of the normal subjects experienced mild abdominal discomfort and borborygmi, but there was no nausea, vomiting or diarrhoea.

Summary

Serum penicillin levels were estimated on 12 normal subjects using varying dosage of 'Distaquaine V'.

The levels obtained and their duration were considered satisfactory, although considerable individual variation was still encountered.

In three patients receiving treatment with 'Distaquaine V' no cumulative effect was noted.

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