

## DOXYCYCLINE IN THE TREATMENT OF UNCOMPLICATED GONORRHOEA

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### Summary

Gonorrhoea constitutes nine per cent of the sexually transmitted diseases seen at the Department of Dermatology and Venereology, Nair Hospital, Bombay. Fifty cases of uncomplicated gonorrhoea in males were treated with doxycycline 200 mgs. I.V. on the first day and 100 mgs. I.V. for 2 more days - a total of 400 mgs. doxycycline. Smears for gonococci and blood V.D.R.L. were done prior to treatment. The cases were reviewed every week for a period of 3 weeks. Three cases showed a positive serology and 44 cases responded well to therapy giving a success rate of 88%. Side effects were minimal.

Sexually transmitted diseases are on the increase not only in Bombay but all over the world. At the Department of Dermatology and Venereology, Nair Hospital, Bombay - Syphilis constitutes 34% of the S.T.D. cases; chancroid 29%; gonorrhoea 9% and others 28%. The incidence of gonorrhoea over the last 5 years has shown a steady rise (Fig. 1)

The reasons for increase in new cases of gonorrhoea are manifold. Increase in promiscuity, increase in urban population and movement of population, rapid industrialisation, rejection of tradi-

tional moral principles and codes of behaviours of young people, resistance of gonococcus to antibiotics resulting in failure of treatment; modern contraceptive methods, ignorance and reservoir of infection in women and now in men, constitute some of the important reasons.

It is evident that the treatment of gonorrhoea which until recently many regarded as a simple matter, has become complex because of some deterioration in the effectiveness of the main remedies, which have been used extensively by a rise in the number of patients who are sensitised to them, by a multiplicity of new remedies and by variations of experience, not only in different areas of the world, but also by different observers working in the same area. The fact remains that no treatment is effective in all the cases and that some give an appreciable proportion of failures. Proper management of these cases requires stringent observation and tests for cure and continuous assessment to ensure that methods which have proved effective remain so.

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This paper was presented at the 6th Annual Conference of IADV & L on 5th Feb 1978 at Calcutta.

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Received for Publication on 28-3-1978

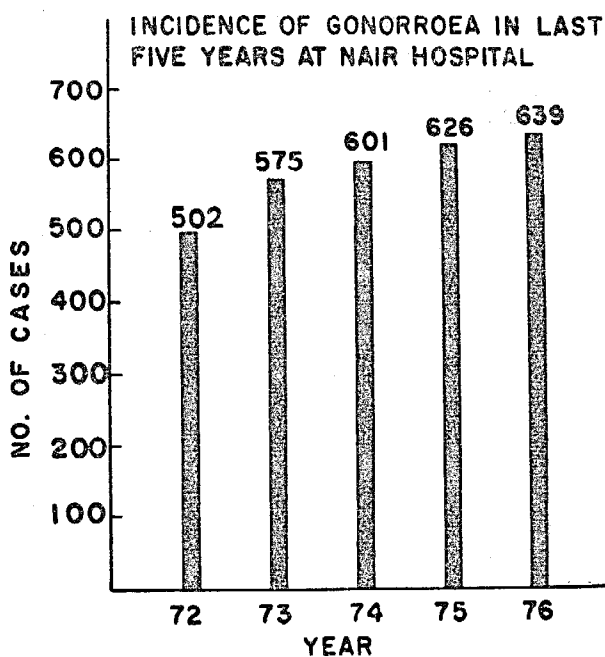


Fig. 1

### Material and Methods

This is a study of 50 cases of uncomplicated gonorrhoea in males treated with I. V. doxycycline. The patients on interview were investigated—urine and urethral smears for gonococci, and blood V.D.R.L. test. They were given 200 mgs by direct I.V. route on the first day, and 100 mgs. for 2 more days—a total of 400 mgs doxycycline was administered by I.V. route. They were reviewed every week for a further period of 3 weeks. Urine examination and smears were done. No cultural studies were undertaken.

Table 1 shows the age incidence and marital status of the 50 cases. Most cases were from the low income group. The youngest case a 17 year old boy and the eldest a 60 year old man. In the unmarried group there were 42 cases as compared to 8 cases who were married.

### Results :

Table 2 shows the results of treatment with doxycycline. Of the 50 cases

proved by smears for gonococci, 3 cases showed positive serology and 44 cases responded well to therapy giving a success rate of 88%. 6 cases did not respond to the regime of treatment and other modalities of treatment had to be given to them.

I.V. Doxycycline had the advantage of being an injection preparation and given slowly no untoward effects were seen. It had an important patient holding asset, in that patients would report regularly for treatment. Two cases complained of mild nausea and vomiting and one case had pyrexia and mild thrombophlebitis. If the injection was given slowly for 5-7 minutes I.V. these complications could be eliminated.

TABLE 1  
Age incidence and marital status

Age in years	No. of patients	Married	Un-married
15 - 20	5	Nil	5
21 - 30	37	3	34
31 - 40	6	4	2
41 and above	2	1	1
	50	8	42

### Serum and urinary excretion levels of doxycycline.

Fig. 2 shows the comparative average serum levels of doxycycline 200 mgs. given I.V. and orally in 6 volunteers. The peak level was 33 mcg/ml. after  $\frac{1}{2}$ -an hour in the intravenous schedule. By 12 hours it was 4.2 mcg/ml, by 24 hours 1.91 mcg/ml and by 48 hours 0.7 mcg/ml. The oral schedule showed a peak level of 6.6 mcg/ml after 4 hours, 1.81 mcg/ml after 12 hours, 1.30 mcg/ml after 24 hours and 0.68 mcg/ml after 48 hours. These serum levels are adequate for the cure of gonococcal infection.

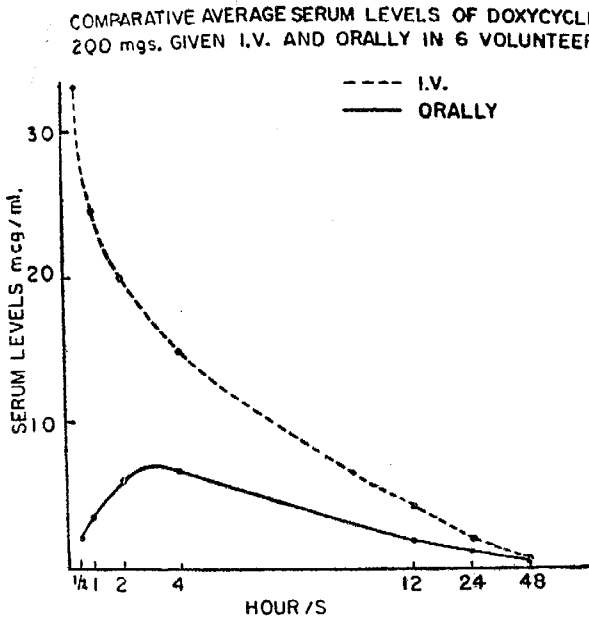


Fig. 2

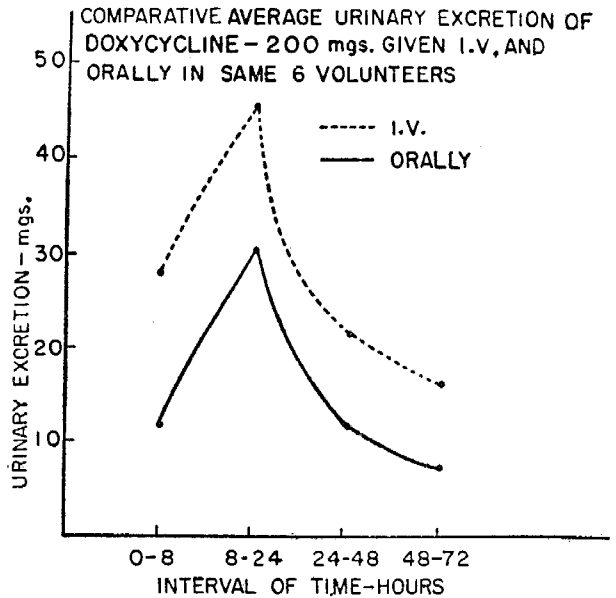
Fig. 3 shows the average urinary excretion of doxycycline 200 mgs given I.V. and orally in same 6 volunteers. The concentration of doxycycline in the intravenous schedule at 48-72 hours showed 16.6 mgs and in the oral schedule at 48-72 hours 7.7 mgs. These high levels were beneficial for the cure of gonococcal infection. Mathisen<sup>1</sup> using doxycycline orally prior to prostatectomy found an average doxycycline concentration of 2.75 mg/g of prostatic tissue which was far above the therapeutic level. This finding suggests a tendency for this antibiotic to accumulate in the prostatic tissue, an essential requisite in the treatment of gonorrhoea.

**Discussion**

There have been numerous reports in the use of doxycycline, a long acting derivative of tetracycline, in the treatment of gonorrhoea. Van

Steenbergen<sup>2</sup> in Holland gave 200 mgs. in 32 cases and reported 87.5% success. Gray et al<sup>3</sup> using a single dose of 300 mgs by mouth achieved a success rate of 87.3% in the treatment of 100 men. Gallai et al<sup>4</sup> using a single dose of 300 mgs. obtained a cure rate of 95%. Moffet et al<sup>5</sup> in Scotland used the same dose and reported 93.6% success in 103 women. Mutchnik<sup>6</sup> in U.S.A. used 300 mgs. in 51 servicemen with 78.4% success. Petzoldt<sup>7</sup> in Germany used the same dose in 129 men with 90.7% success. However, Baytch and Rankin<sup>8</sup> in Australia used 500 mg. and had a poor success rate of 47%. Robinson et al<sup>9</sup> using

300 mgs doxycycline administered twice with a 1 hour interval treated 144 males and 63 females and obtained a success rate of 97% and 95% respectively. Schulman<sup>10</sup> using 200 mgs of the drug



AVERAGE CONC. OF DOXYCYCLINE IN PROSTATE-TISSUE 2.75 mg/g

(MATHISEN W.-EUR. UROL. 1975 1/3 157-58)

Fig. 3

TABLE 2  
Results

No. of cases	Bl. V.D.R.L.		Urine & Urethral Smear		Follow up after 20 days		Result		%	
	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Cure	Failure	Cure	Failure
50	3	47	50	Nil	6	44	44	6	88	12

orally for 5 days and 500 mgs for two days in 100 cases found results of both schedules identical i.e. 95% cure.

Thus the variations in experience of workers in different areas of the world with doxycycline in the treatment of gonorrhoea depend on the local strains of gonococci. One fact remains that no single treatment is effective in all cases and that some drugs will give an appreciable proportion of failures. Comparison of our study with that of other workers show a range of success of 80-90% with doxycycline. In our study the percentage of success was 88% and side effects were negligible.

Since gonococci are gradually getting resistant to various antibiotics, proper management of cases requires stringent observation and tests for care. Continuous monitoring of newer drugs is essential to assess that methods which have proved effective, remain so.

#### Conclusions:

In this study of doxycycline in the treatment of 50 cases, of gonorrhoea the success rate was 88%, side effects were negligible.

#### Acknowledgements:

We are deeply grateful for the help of our house staff, registrar, technician Mr. S. Venkatesan, Dr. S. S. Gandhi for all his technical help and M/s. Gufic Lab. for the supply of Leen brand of doxycycline I.V injections used in this study and the dean Dr. M.S. Kekre for permission to utilise the hospital records.

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