

Minimum Inhibitory Concentrations of Metronidazole and Tinidazole against *Trichomonas vaginalis*

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BACKGROUND

Trichomonas vaginalis

- Flagellated protozoan
- One of the causative agents of vaginal discharge syndrome
- Treated with metronidazole as part of syndromic management

Syndromic management

- An approach to treatment of sexually transmitted diseases
- Consists of a combination of drugs used to target the most common causative agents of a particular syndrome without performing laboratory tests to first determine which agent is present, or the susceptibility profile of the agent (1)
- Requires frequent surveillance since the prevalence of certain organisms and their susceptibility profiles may change over time

AIM

- To compare the antimicrobial effect of nitroimidazoles on *T. vaginalis* isolates collected in KwaZulu-Natal, South Africa

METHODOLOGY

Specimen collection and culture

- Specimens were collected from women 18 years or older presenting with vaginal discharge syndrome at Boom Street Clinic in Pietermaritzburg and Umlazi D Clinic in Durban KwaZulu-Natal, South Africa.
- A total of 617 vaginal specimens were collected using a Dacron swab and cultured in modified Diamonds medium with antibiotics
- A wet amount was prepared after 48 hours and visualised with a dark field microscope to detect viable trophozoites. This was done each day for seven days after which trichomonad negative cultures were discarded
- Trichomonad positive cultures were sub-cultured into drug-free diamonds medium twice before susceptibility testing was performed
- Of the 617 isolates, 94 were positive for *T. vaginalis*.

Antimicrobial susceptibility testing

- A micro-broth dilution assay was used
- Trichomonads (3×10^3 per well) were inoculated into the wells of 96 well plates with Diamonds medium containing two-fold dilutions (16 – 0.25 mg/L) of metronidazole or tinidazole and incubated anaerobically for 72 hours
- Trichomonad numbers and viability were assessed using an inverted phase contrast microscope and the MIC and MLC determined

Controls

- *Propionibacterium acnes* (ATCC 11827) – high MIC (resistant) control
- *Bacteroides fragilis* (ATCC 25285) – low MIC (susceptible) control

MIC was defined as a score of 1+

MLC was defined as the drug concentration at which no motile parasites were seen

Scoring for MIC determination

- | | |
|------------------------------------|----|
| • Few motile parasites (1-10) | 1+ |
| • Several hundred motile parasites | 2+ |
| • Almost confluent | 3+ |
| • Confluent | 4+ |

All isolates that had an MIC > 2 mg / L were repeated to confirm the results

RESULTS

Table 1: MIC and MLC of *T. vaginalis* isolates (n= 94) against metronidazole and tinidazole after 48 and 72 hours of incubation

	MIC				MLC			
	Metronidazole		Tinidazole		Metronidazole		Tinidazole	
	48 h	72 h	48 h	72 h	48 h	72 h	48 h	72 h
< 2 mg / L	57	55	75	68	45	41	56	59
= 2 mg / L	27	27	17	25	31	35	36	33
> 2 mg / L	10	12	2	1	18	17	3	2

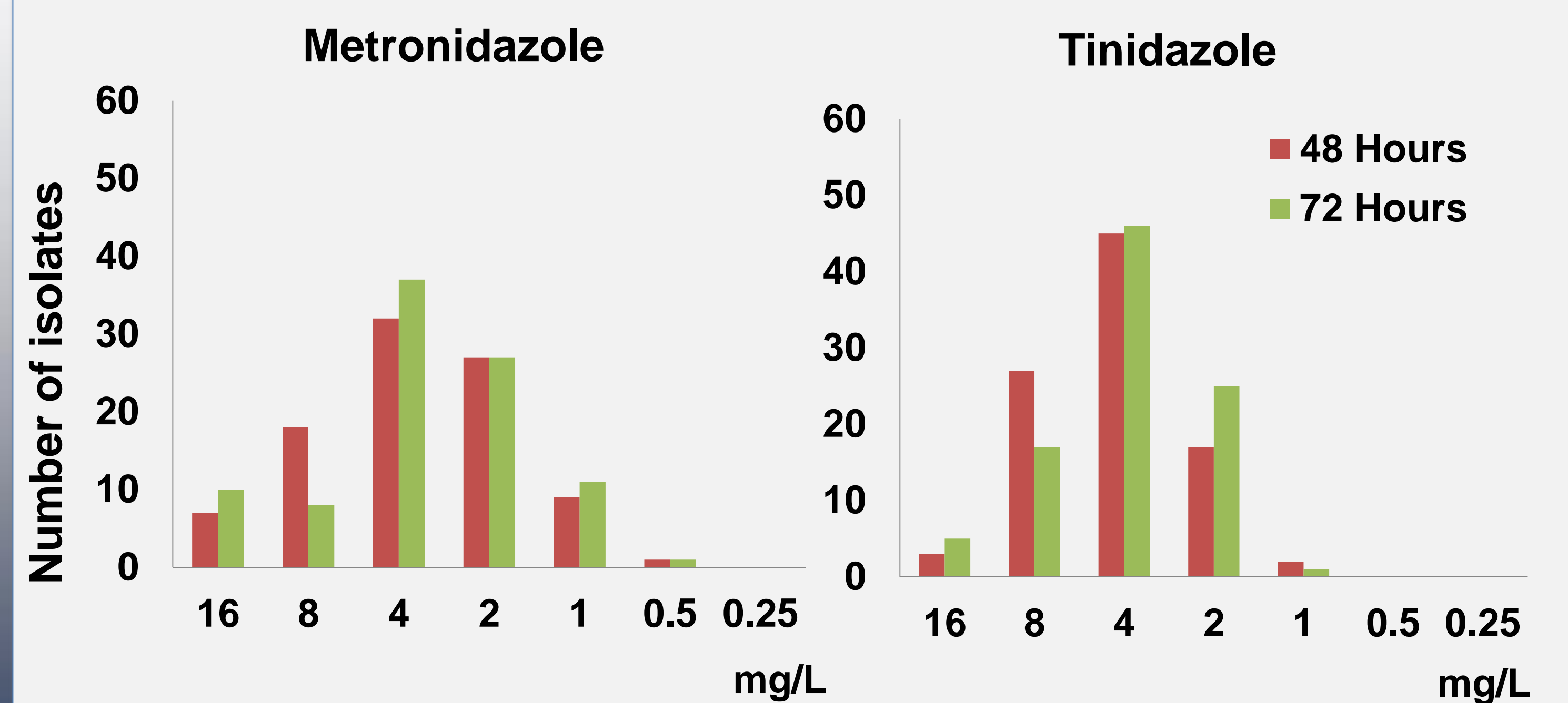


Figure 1: Minimum inhibitory concentration of 94 *T. vaginalis* isolates

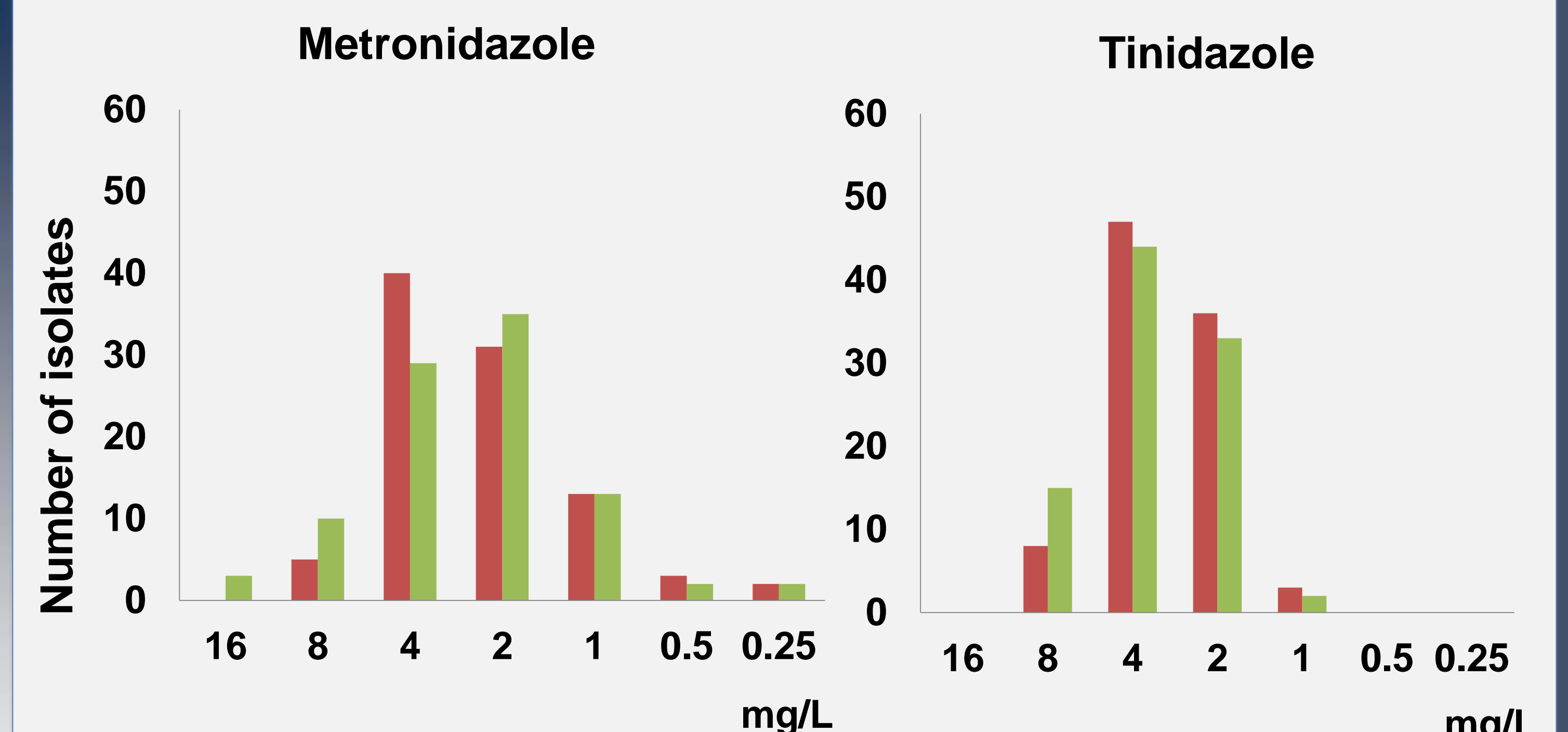


Figure 2: Minimum lethal concentration of 94 *T. vaginalis* isolates

DISCUSSION AND CONCLUSION

Tinidazole showed greater *in vitro* efficacy than metronidazole, the current drug used to treat trichomoniasis

It is unclear whether these high MICs indicate clinical resistance since there is no established breakpoint for these drugs for *T. vaginalis*

High MICs and MLCs are a cause for concern since there is no alternative non-nitroimidazole chemotherapy available for the treatment of trichomoniasis

It is also unknown whether one should use MIC or MLC to measure the efficacy of these drugs

Further research is required to determine which MIC *in vitro* correlates with clinical failure

REFERENCES

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