



Sexually Transmitted Infections - Missing Some, Treating Some, Overtreating Many; A Nationwide Survey in a Primary Care Setting in Israel

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Take home messages

- This study describes the results of consecutive 2816 PCR tests for STI of Israel Defense Forces soldiers.
- Positivity for a major STI was 9.2%, but positivity for equivocal infections (*Ureaplasmas*, *Mycoplasma hominis*) was significantly higher (6-28%), especially for females (up to 44%).
- More antibiotics were given to cases with equivocal infections than to major STI cases.
- Management of STI was sub-optimal, suggesting better education and guidance for caregivers and the need for specialized STI clinics.
- Symptoms were predictive of STI in males only, strengthening the need for screening in females.

Background

Data regarding sexually-transmitted infections (STI) often origin from STI clinics, screening programs or laboratory-based studies thus biased for specific risk-groups or lack clinical details. Moreover, data concerning the impact of novel advanced molecular diagnostics on STI treatment patterns is currently lacking. Molecular assays enable rapid and sensitive detection of multiple pathogens, some of which (i.e. ureaplasmas and mycoplasmas) comprise the normal genitourinary flora and were rarely tested for in the past.

Aims

- To collect STI epidemiology data from a primary care setting that is representative of the general young Israeli population.
- To assess real-life clinical practice related to STI diagnosis and treatment

Methods

- Retrospective cross-sectional study (Jun-Dec 2014) of all routinely performed STI assays of Israel Defense Forces (IDF) soldiers.
- Military service is mandatory for both genders at the age 18 in Israel.
- Samples were tested using multiplex PCR (Anyplex II STI-7, Seegene) for *N. gonorrhoea* (NG), *C. trachomatis* (CT), *T. vaginalis* (TV), *M. genitalium* (MG), *M. hominis* (MH), *U. urealyticum* (UU), *U. parvum* (UP).
- Demographic, epidemiological and clinical data were collected from electronic medical records
- Major STI = NG / CT / MG / TV
- Equivocal STI = UU / UP / MH
- Negatively tested cases served as controls for risk factor analysis

Results

1. Positivity rates and coinfections

N=2816 cases (42.4% females, median age 19.9 years (range 17.9-52.4)), 53.5% had negative results.

Pathogen	Major STI ^b	CT	MG	NG	TV	UU	UP	MH
Group								
Total	9.2%	6.7%	1.9%	0.6%	0.4%	15.4%	28.2%	6.1%
Female	9%	6.5%	2.3%	0.2%	0.8%	17.2%	44.4%	7.9%
Male	9.3%	6.8%	1.6%	1%	0.2%	14.2%	16.2%	4.7%
Coinfection								
CT	---	---	14%	5%	15.4%	11.7%	10.2%	16.2%
MG	4.1%	---	---	10%	0%	3.2%	3.4%	5.4%
NG	0.5%	0.5%	---	---	0%	0.6%	0.5%	0.5%
TV	1%	0%	0%	---	---	0.9%	19%	2.2%
UU	28.1%	26.3%	15%	30.8%	---	---	11.6%	41.6%
UP	43.9%	50.9%	20%	61.5%	---	---	---	65.4%
MH	15.3%	17.5%	5%	0%	16.4%	14.4%	---	---

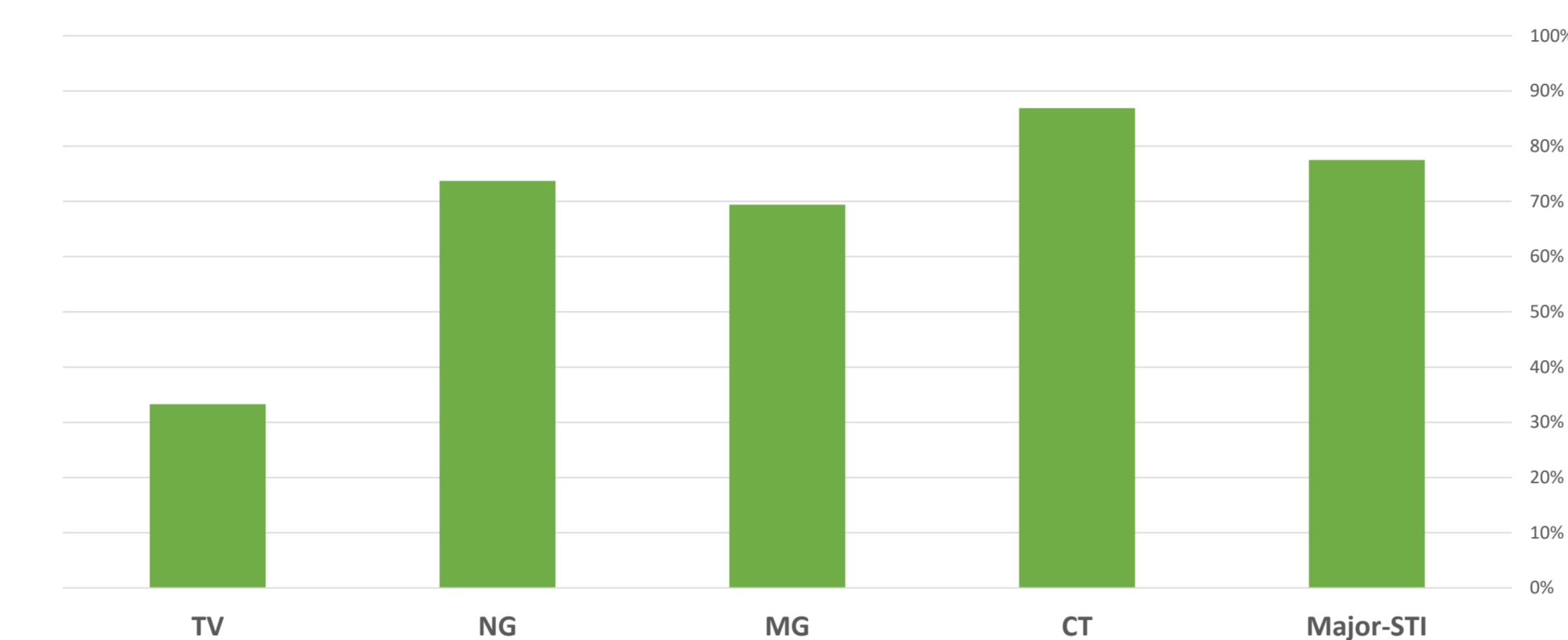
CT/NG coinfection was rare (<1%)
CT/MG was more common (4%)

2. Risk factor analysis

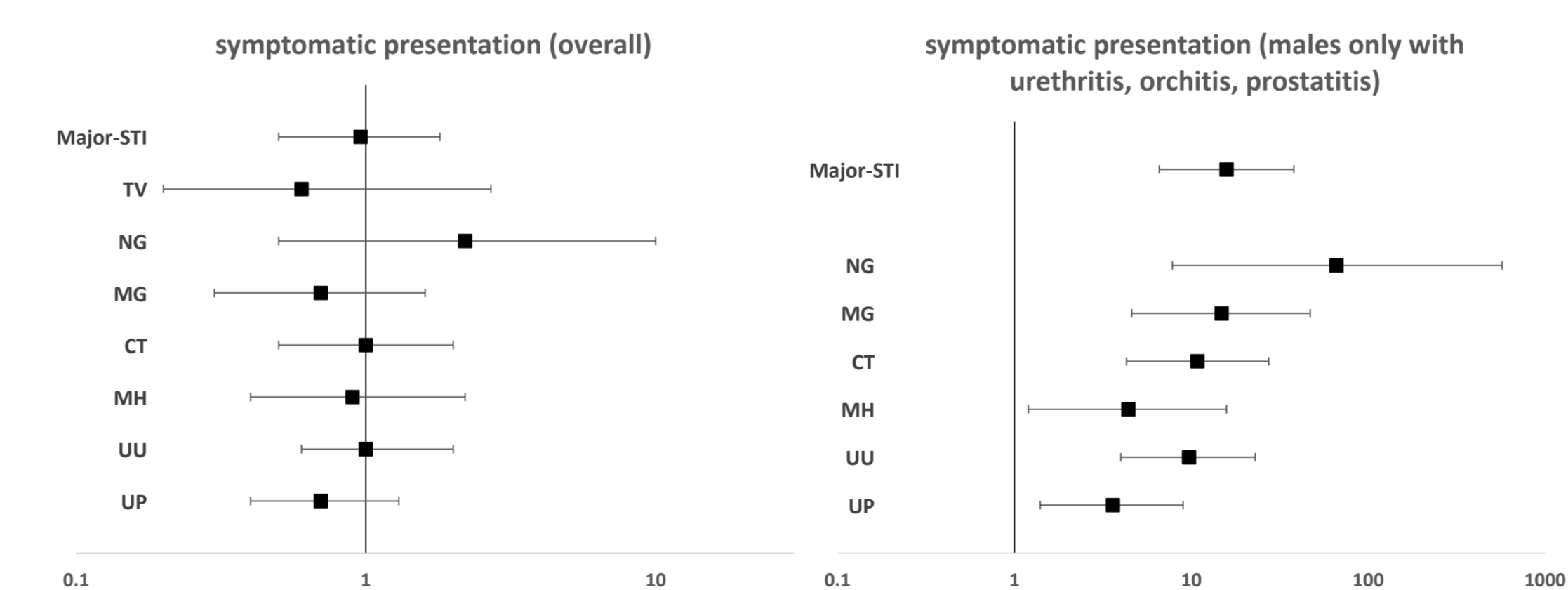
	CT	MG	NG	TV	Any major STI	UU	UP	MH
Univariate analysis								
Female sex	OR=0.17*	OR=4.1*	OR=0.17*	OR=4.1*	OR=1.2*	OR=2.7*	OR=1.7*	OR=1.7*
High school education only			(0.04-0.7)	(1.1-15)	(1-1.5)	(2.3-3.3)	(1.2-2.3)	
Meeting a mental health officer in the last year					OR=1.7*	OR=1.3*	OR=2.2*	
					(1.1-2.5)	(1-1.7)	(1.3-4.5)	
New sexual partner in the past 3 months	OR=15*	OR=7*		OR=9.4*	OR=7.8*	OR=4.5*	OR=6*	
	(4.4-52)	(1.8-30)		(3.5-25)	(2.7-22.6)	(1.8-11.8)	(1.5-25)	
Unprotected vaginal/anal sex	OR=3.27*	OR=2.72*		OR=2.6*	OR=5.3*	OR=3.4*	OR=2.9*	
	(1.4-7.8)	(1-7.8)		(1.2-5.5)	(2.1-13.5)	(1.6-7.5)	(1-8.3)	
Multivariate analysis								
Female sex					OR=1.7*	OR=4*	OR=2.3*	
					(1.3-2.1)	(3.3-4.8)	(1.7-3.3)	
High school education only					OR=1.6*	OR=1	OR=1.9	
					(1-2.4)	(0.8-1.4)	(0.9-3.8)	
Meeting a mental health officer in the last year					OR=1.2	OR=1.1	OR=1.3	
					(0.9-1.5)	(0.9-1.4)	(0.9-1.9)	

* p<0.05

3. Treatment per CDC guidelines

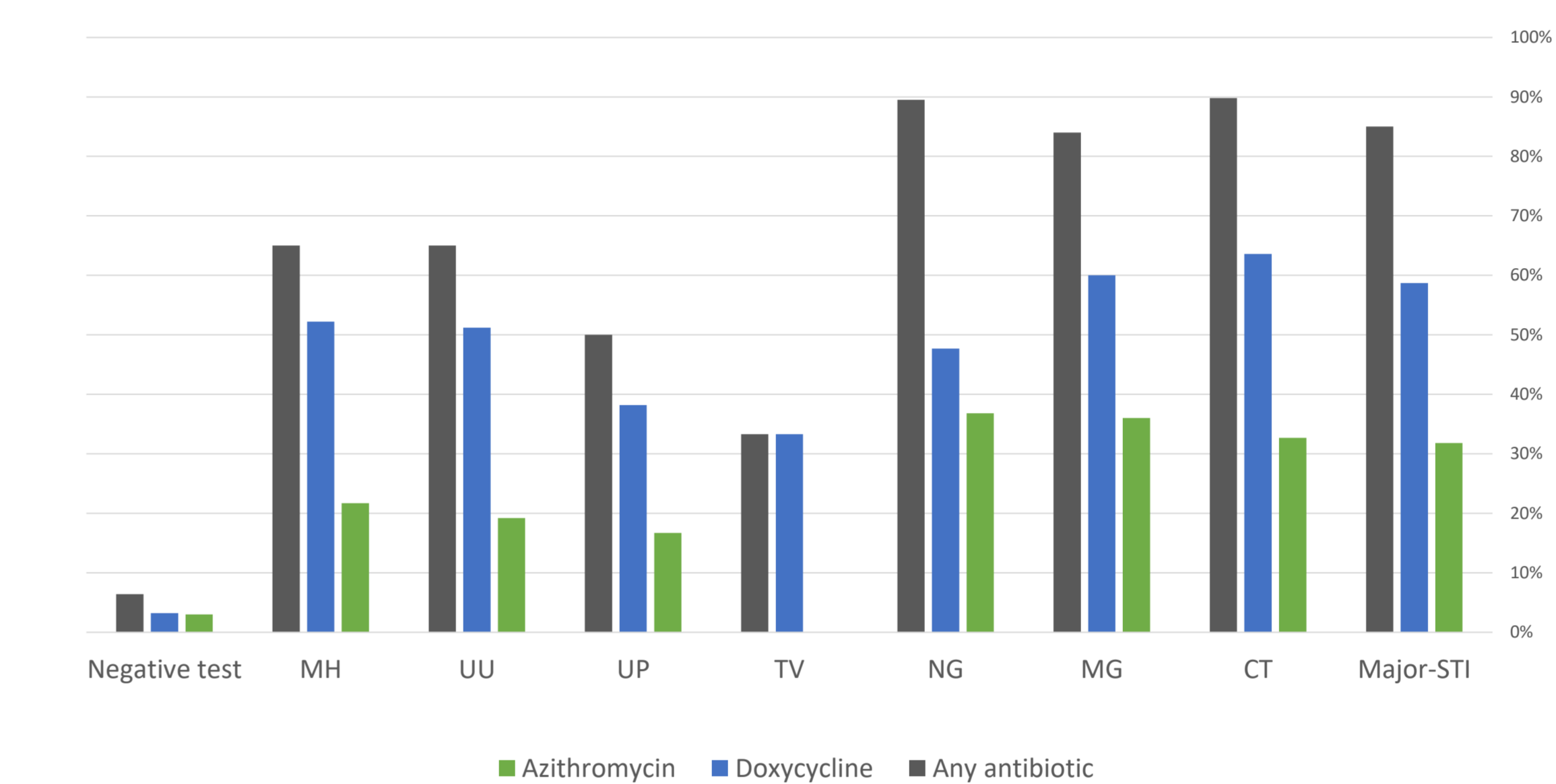


4. Association with symptoms

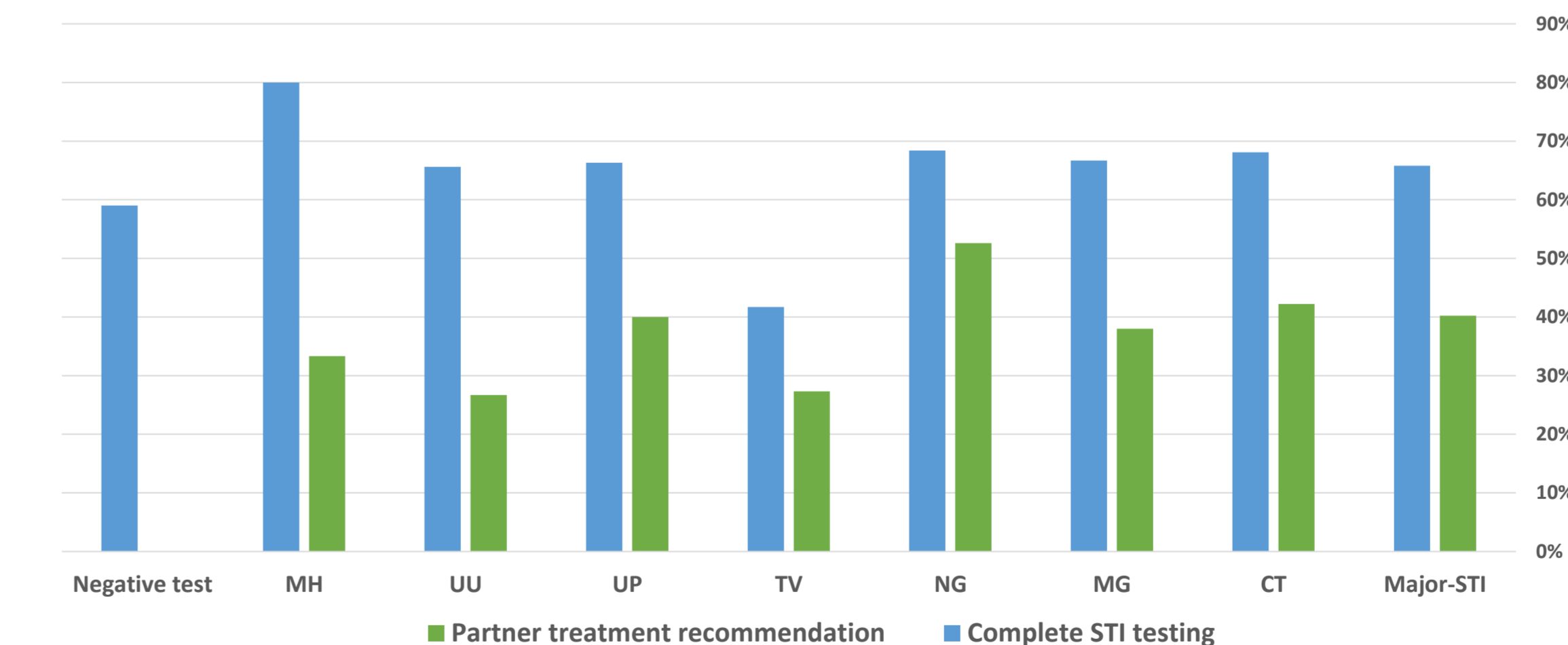


Presence of any symptoms was not predictive of test results.
Classical symptoms in males (urethritis, prostatitis, orchitis) was predictive of STI positivity:
Highly associated with major STI and UU (OR>10)
Weakly associated with UP, MH (OR~4)

5. Antibiotic treatment



6. Additional management



Strengths

- Unique methodologic setup:
- Mandatory military service – cohort is representative of the sexually active young Israeli population – excellent generalizability
- Data quality – military medical records are computerized, detailed and centralized.
- Diagnostics – all assays were performed in a single laboratory using a single validated platform, assuring its reliability and reproducibility.

Limitations

- Retrospective
- Reliance on digital reports for sexual exposure history – incomplete history taking, disclosure and reporting.
- Negative results as controls – testing bias

Conclusions

- Despite simple and clear clinical guidelines for STI management, nearly a quarter were not treated with adequate antibiotics, a third were not cross-tested, and in up to a half, partner management was not offered.
- More antibiotics were given for UU, UP and MH than to all major-STI cases.
- Coinfection with NG was rare. Empiric NG coverage in every STI is probably unnecessary without high-risk factors, when testing and follow-up is assured
- MG infection is common – should be included in routine STI diagnostics and treatment regimens (i.e. preference for azithromycin over doxycycline)
- Clinical presentation is predictive of STI in males with urethritis but not in females – screening is important.

