



The Infections of *M. genitalium* and *C. trachomatis* at Various Anatomical Sites of Man Who Have Sex with Man

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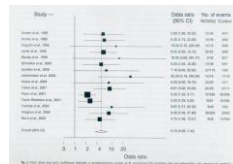


Outlines

- Background
- Design of the study
- Results
- Conclusion

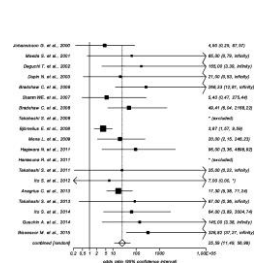


- *C. trachomatis* : the most common sexually transmitted pathogens causing nongonococcal (NGU) urethritis in men
- *M. genitalium* : an established cause of NGU among heterosexual men



Overall OR=5.15, 95%CI 3.58-7.43

Jensen JS. 2004, J Europ Acad Dermatol Venereol, 18:1-11.



Overall OR=25.59, 95%CI 1.49-55.499

Jensen and Bradshaw, 2015, Infectious Diseases,15: 343



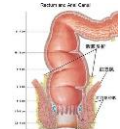
The prevalence of sexually transmitted infections (STIs) in MSM?

This high risk population for STIs including *M. genitalium*(MG) and *C. trachomatis*(CT) infections?

Especially the pharyngeal and rectal infections?



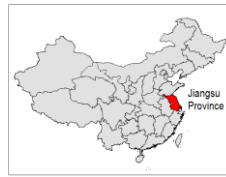
M. genitalium
C. trachomatis
N. gonorrhoeae





A Cross-sectional Study

- MSM: convenient sample, 388/476
- To determine the prevalence of *M. genitalium* and *C. trachomatis* in the urethra, rectum and pharynx of MSM
- To analyze the association between the agents detection and the clinical manifestations



Socio-demographic Characteristics in MSM

Socio-demographic characteristics	No	%
Age		
18-29	225	58.0
30-39	92	23.7
40-70	71	18.3
Education		
Primary school or lower	61	15.7
High school	123	31.7
College or higher	204	52.6
Ethnicity		
Han	380	97.9
Ethnic minorities	8	2.1
Marital status		
Currently married	111	28.6
Single or divorced	277	71.4



Sexual Orientation

Sexual orientation (Kinsey scale)	No	%
Exclusively heterosexual	2	0.5
Predominantly heterosexual only incidentally homosexual	51	13.1
Predominantly heterosexual but more than incidentally homosexual	34	8.8
Equally heterosexual and homosexual	27	7.0
Predominantly homosexual but more than incidentally heterosexual	30	7.7
Predominantly homosexual only incidentally heterosexual	67	17.3
Exclusively homosexual	177	45.6
Total	388	100



Sexual Behaviors

- More than half (59.8%) no female sexual partner in the past 3 mths
- The majority (95.4%) more than one male sexual partner in the past 3 mths
- One third of them never used condom in the past 3 mths
- 30.7% choosed not to answer this question



Serological Test in MSM

	No. of tested	No. of positive (%)	95%CI
HIV	388	4 (1.0)	0.02-2.04
TPPA	388	73 (18.8)	14.93-22.70
RPR	388	47 (12.1)	8.87-15.36
HSV-2 IgG	388	38 (9.8)	6.84-12.75
HBV(HBsAg)	388	38 (9.8)	6.84-12.75
HCV(Anti- HCV)	388	4 (1.0)	0.03-2.04



Prevalence of MG, CT and NG at Urethral, Rectal and Pharyngeal Sites

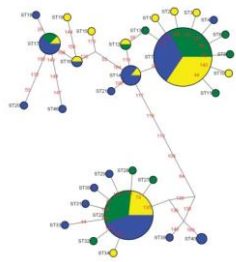
Sites Infected	<i>M. genitalium</i> n/ N (%), 95% CI)	<i>C. trachomatis</i> n/ N (%), 95% CI)	<i>N. gonorrhoeae</i> n/ N (%), 95% CI)
Urethral	66/384 (17.2, 13.4-21.0)	36/385 (9.4, 6.4-12.3)	5/388 (1.3, 0.2-2.4)
Rectal	41/347 (11.8, 8.4-15.2)	56/350 (16.0, 12.2-19.8)	5/388 (1.3, 0.2-2.4)
Pharyngeal	47/349 (13.5, 9.9-17.1)	3/388 (0.8, 0.1-1.6)	2/388 (0.5, 0.2-1.2)



Distribution of MG, CT and NG Infections by Anatomic Sites

	No. (%) of Infected subjects		
	<i>M. genitalium</i> (n=133)	<i>C. trachomatis</i> (n=81)	<i>N. gonorrhoeae</i> (n=12)
Urethral only	49 (36.8%)	22 (27.2%)	5 (41.7%)
Rectal only	31 (23.3%)	42 (51.9%)	5 (41.7%)
Pharyngeal only	32 (24.1%)	2 (2.5%)	2 (16.7%)
Urethral & rectal	6 (4.5%)	14 (17.3%)	0 (0%)
Urethral & pharyngeal	11 (8.3%)	1 (1.2%)	0 (0%)
Rectal & pharyngeal	4 (3.0%)	0 (0%)	0 (0%)
All 3 sites	0 (0%)	0 (0%)	0 (0%)

Note : A total of 388 men were tested for *M genitalium*, *C trachomatis* and *N gonorrhoeae* at one site or more



- mgbB SNP typing from 21 MSM who were detected *M genitalium* at two anatomical sites
- Ten matching a molecular typing at the two sites
- Multiple sexual partners may be the cause of different *M genitalium* strains infected in different anatomical sites of the same participant

Network based on mgbB SNP typing: ● Rectal ● Urethral ● Pharyngeal
The size of circle matches the frequency of SNP typing



Association of Infections of Urethral MG & CT with Clinical Manifestation

	Urethral <i>M. genitalium</i>			Urethral <i>C. trachomatis</i>		
	Positive n (%)	OR (95% CI)	P value	Positive n (%)	OR (95% CI)	P value
Urethral discharge			P=0.298			P=0.078
Yes	11 (22.4%)	1.47 (0.71-3.06)		8 (16.3%)	2.15 (0.92-5.03)	
No	55 (16.4%)	1.00		28 (8.3%)	1.00	
Urethral discomfort			P=0.004			P=0.244
Yes	18 (30.5%)	2.56 (1.36-4.83)		8 (13.6%)	1.65 (0.71-3.82)	
No	47 (14.6%)	1.00		28 (8.7%)	1.00	
PMNL			P=0.016			P<0.001
0-4	54 (15.6%)	1.00		25 (7.2%)	1.00	
5 or more	12 (31.6%)	2.50 (1.19-5.25)		11 (28.9%)	(2.33-11.80)	

OR=Odds Ratio; CI=Confidence Interval; PMNL= polymorphonuclear leucocyte counts per high-power microscope field
Note: Non-significant variables were not showed in the table.



Association of Rectal MG and CT Infection with Sexual Behavior and Clinical Manifestation

	Rectal <i>M. genitalium</i>			Rectal <i>C. trachomatis</i>		
	Positive (%)	OR (95% CI)	P value	Positive (%)	OR (95% CI)	P value
Receptive anal sex in past 3 months			P=0.740			P=0.036
Yes	20 (12.4)	1.11 (0.58-2.14)		33 (20.5)	1.86 (1.04-3.32)	
No	21 (11.3)	1.00		23 (12.2)	1.00	
Rectal discharge			P=0.002			P=0.678
Yes	6 (40.0)	5.60 (1.88-16.67)		3 (20.0)	1.32 (0.36-4.82)	
No	35 (10.6)	1.00		53 (16.0)	1.00	
Rectal tenosinus			P=0.002			P=0.168
Yes	12 (27.3)	3.43 (1.59-7.37)		4 (9.1)	0.47 (0.16-1.37)	
No	29 (9.9)	1.00		52 (17.5)	1.00	

Note: Non-significant variables were not showed in the table.



Multivariable Analyses of MG and CT Infections with Clinical Manifestation

	Adjusted Odds Ratio (95% CI)	P value
Urethral <i>M. genitalium</i>		
Urethral discomfort		P=0.029
Yes	2.22 (1.09-4.52)	
No	1.00	
PMNL		P=0.044
0-4	1.00	
5 or more	2.40 (1.02-5.62)	
Urethral <i>C. trachomatis</i>		P=0.002
PMNL		
0-4	1.00	
5 or more	4.66 (1.80-12.07)	
Rectal <i>M. genitalium</i>		
Rectal discharge		P=0.008
Yes	6.06 (1.59-23.11)	
No	1.00	
Rectal <i>C. trachomatis</i>		P=0.020
Receptive anal intercourse in past 3 months		
Yes	2.27 (1.14-4.54)	
No	1.00	



Co-infections Detected at One or More Anatomic Sites

- Urethral (first-void urine)
Seven with *M. genitalium*/*C. trachomatis* co-infection
Three with *N. gonorrhoeae*/*M. genitalium* or *N. gonorrhoeae*/*C. trachomatis* co-infections
- Rectal
Four *M. genitalium*/*C. trachomatis* co-infections
Two *N. gonorrhoeae*/*C. trachomatis* co-infections
- Pharyngeal
No co-infection detected



Summary

- A 48.2% of the participants had one or more infections of *M. genitalium*, *C. trachomatis* or *N. gonorrhoeae* at urethral, rectal or pharyngeal site in our study
- Rectal and pharyngeal infections contribute 52.2% of the STIs (not include HIV/syphilis /HSV) in our studied population



Summary

- *C. trachomatis* was more commonly detected in the rectum than in the urethra and was more likely to be asymptomatic
- *M. genitalium* infection was significantly associated with urethral and rectal symptoms
- A high prevalence of *M. genitalium* in pharynx was found, the subclinical nature of *M. genitalium* in this site questions its significance



Conclusions

- MSM population carries a high burden of STIs
- The anorectum and oropharynx is a reservoirs of STIs in MSM, could be a potential source of onward urethral transmission



- More data are needed to understand how common CT and MG infection in urethral and non-urethral sites in MSM
- Future work should assess the need for appropriate screening and treatment of MG infection in MSM, particularly those with high-risk sexual behavior





Thank you for your attention!