

# Mycoplasma hominis increases the risk for Ureaplasma parvum infection in Human immunodeficiency virus infected pregnant women

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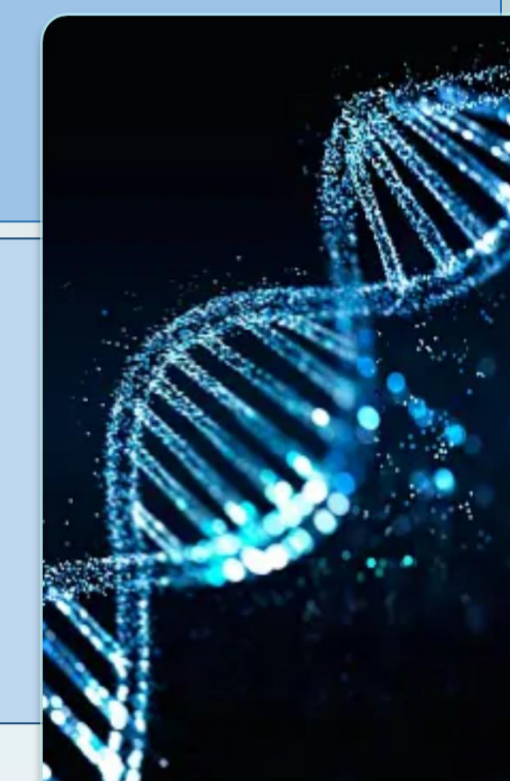
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## AIMS AND OBJECTIVES

To investigate the prevalence and risk factors for genital mycoplasmas in HIV infected pregnant women from King Edward VIII hospital

1. To determine the prevalence of *Mycoplasma genitalium*, *M. hominis*, *Ureaplasma urealyticum* and *U. parvum* in a cohort of HIV infected women
2. To identify the rate of co-infections among these microorganisms
3. To identify risk factors associated with the individual microorganisms



## INTRODUCTION

The species that can potentially lead to significant clinical infections in humans are; *Mycoplasma pneumoniae*, *Mycoplasma hominis*, *Mycoplasma genitalium*, *Ureaplasma parvum* and *Ureaplasma urealyticum*. *M. hominis* was first identified and isolated in 1937 as the first *Mycoplasma* of human origin. The role of this bacteria in causing a disease has been researched over the years and is still not yet fully understood. A recent study conducted by Naicker *et al.* (2021) reported a prevalence of 48% for *M. hominis* for a population of South African pregnant women. A previous study conducted in South Africa by Redelinghuys *et al.* also reported high prevalence data for *M. hominis* (50.7%) in pregnant women from Gauteng, South Africa.

*Ureaplasma* species were only first identified in the last 20 years. In a study conducted by Lee *et al.* (2020) 39.4% cases were positive for genital mycoplasmas, which included 3.1% cases of *M. hominis*, 78.2% cases of *Ureaplasma* species and 18.7% cases of both *M. hominis* and *Ureaplasma* species.

Currently, there are a limited number of studies conducted in South African pregnant women especially from KwaZulu-Natal which have assessed the prevalence and risk factors for genital mycoplasmas.

Table 2. Characteristics of the study women according to *U. parvum* status

<i>U. parvum</i>	Neg (N=61)	Pos (N=203)	p-value	Overall (N=264)
<b>Partners HIV status</b>			0.049	
Don't know	6 (9.8%)	34 (16.7%)	Chisq.	40 (15.2%)
Negative	28 (45.9%)	60 (29.6%)		88 (33.3%)
Positive	27 (44.3%)	109 (53.7%)		136 (51.5%)
<b>Lifetime sex partners</b>			0.012	
>4	7 (11.5%)	47 (23.2%)	Chisq.	54 (20.5%)
1	26 (42.6%)	50 (24.6%)		76 (28.8%)
2_4	28 (45.9%)	106 (52.2%)		134 (50.8%)
<b>Partner has other partners</b>			0.023	
Don't know	33 (54.1%)	105 (51.7%)	Chisq.	138 (52.3%)
No	20 (32.8%)	41 (20.2%)		61 (23.1%)
Yes	8 (13.1%)	57 (28.1%)		65 (24.6%)
<b><i>M. hominis</i></b>			0.004	
Neg	19 (31.1%)	30 (14.8%)	Chisq.	49 (18.6%)
Pos	42 (68.9%)	173 (85.2%)		215 (81.4%)

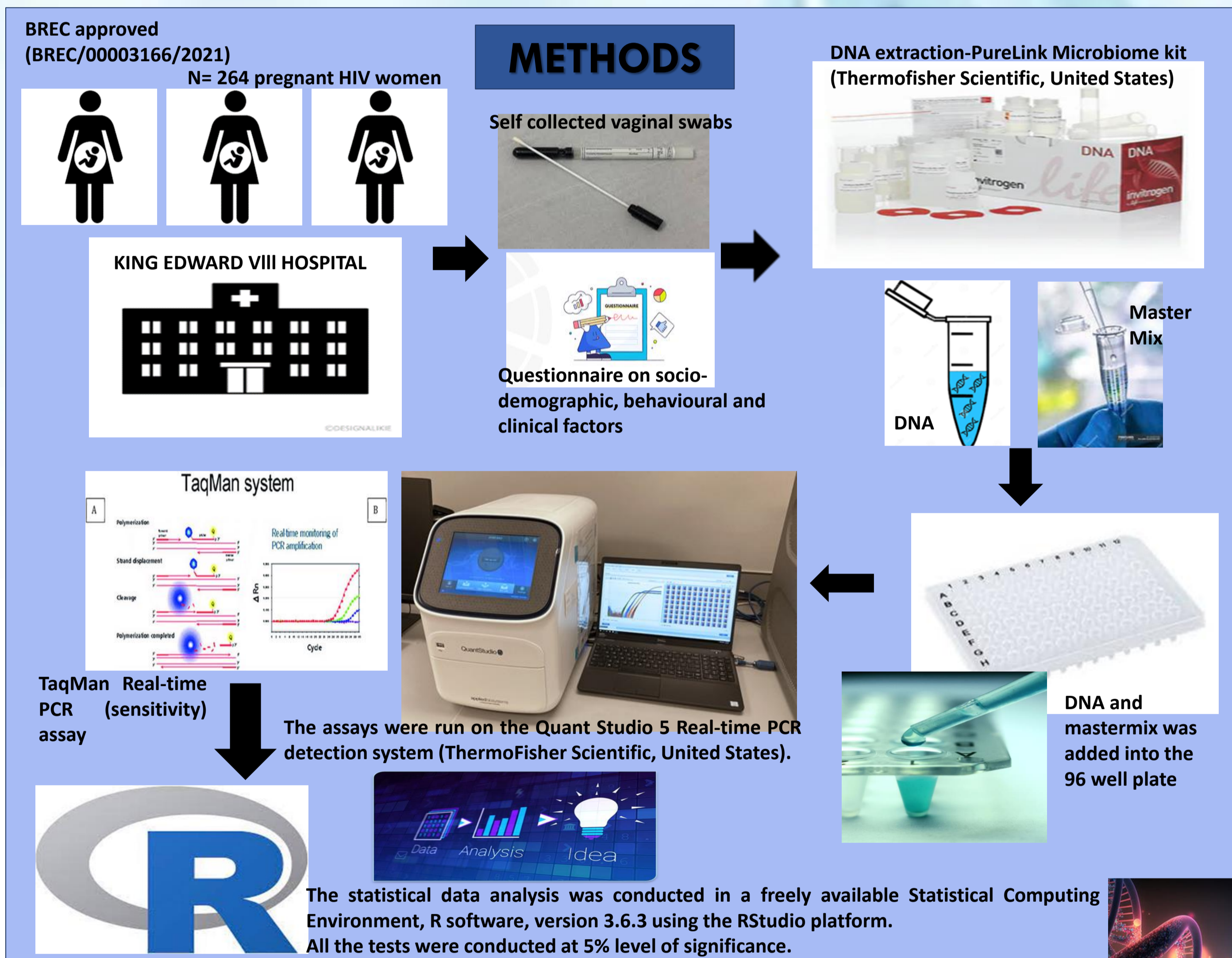


Table 3. Risk factors associated with *U. parvum* infection

Variable	Unadjusted odds ratio (OR), 95% Confidence Interval (CI)	Adjusted odds ratio (OR), 95% Confidence Interval (CI)	Further Adjusted odds ratio (OR), 95% Confidence Interval (CI): Backstep analysis
Lifetime sex partners 2-4	2.10 (1.06-4.18, p=0.033)	3.08 (1.29-7.67, p=0.013)	2.77 (1.21-6.50, p=0.017)
Lifetime sex partners >4	20.65 (4.08-377.29, p=0.004)	88.02 (10.85-2157.18, p<0.001)	81.29 (10.91-1914.65, p<0.001)
Partner has other partners Yes	4.80 (1.72-15.68, p=0.005)	6.72 (1.74-29.76, p=0.008)	6.84 (1.92-28.31, p=0.005)
<i>M. hominis</i> Pos	2.53 (1.18-5.26, p=0.014)	4.33 (1.48-13.10, p=0.008)	4.05 (1.45-11.55, p=0.008)



## RESULTS

Table 1. Characteristics of the study women according to *M. hominis* status

<i>M. hominis</i>	Neg (N=49)	Pos (N=215)	p-value	Overall (N=264)
<b><i>U. urealyticum</i></b>			0.051	
Neg	9 (18.4%)	19 (8.8%)	Chisq.	28 (10.6%)
Pos	40 (81.6%)	196 (91.2%)		236 (89.4%)
<b><i>U. parvum</i></b>			0.004	
Neg	19 (38.8%)	42 (19.5%)	Chisq.	61 (23.1%)
Pos	30 (61.2%)	173 (80.5%)		203 (76.9%)
<b>Partner STI symptom</b>			0.027	
No	32 (65.3%)	172 (80.0%)	Chisq.	204 (77.3%)
Yes	17 (34.7%)	43 (20.0%)		60 (22.7%)
<b>Current STIs symptoms</b>			<0.001	
No	40 (81.6%)	112 (52.1%)	Chisq.	152 (57.6%)
Yes	9 (18.4%)	103 (47.9%)		112 (42.4%)

## DISCUSSION AND CONCLUSION

*M. hominis* and *U. parvum* form part of the normal human flora and are found mostly in the respiratory, reproductive, and urinary tracts. However, studies have shown that these bacteria are sexually transmitted and can be linked to sexually transmitted diseases and other conditions.

The data obtained with this study is comparable to previous studies conducted by Redelinghuys *et al.* (2013) and Naicker *et al.* (2021) who reported moderately high prevalence data for *M. hominis*, 50.7% and 48% in pregnant women. The prevalence of *M. hominis* in this study is higher (81.4%) when compared to previous studies. Our study prevalence may be higher than other studies due to socioeconomic factors. The prevalence rates for each organism will differ according to respective geographical locations.

In this study, a high coinfection rate was observed between *M. hominis* and *U. urealyticum* (91.2%) and *M. hominis* and *U. parvum* (80.5%). In a South African study conducted by Taku *et al.* (2021), a high coinfection rate was observed for *U. parvum* and *M. hominis* (26.9%). These high rates could be attributed to the type of population sampled. Our study population was a HIV infected population and there is usually a high prevalence of treatable STIs in pregnancy especially in HIV-infected women.

Our findings show that being infected with HIV revealed that individuals were at a higher risk of STI acquisition and other infections. Individuals infected with HIV have compromised immunity which makes it easier to transmit and acquire pathogens.

Testing positive for *M. hominis* was significantly associated with testing positive for *U. parvum*.

To date, there are a limited number of studies that have investigated the association between testing positive for *M. hominis* being a risk factor for *U. parvum* infection.

A past study had reported on the significant association between *Ureaplasma* species and *M. hominis* infection and not on *U. parvum* exclusively.

Therefore, the data presented in the current study now fills in this gap in the literature.

The present study provides information on the risk factors that are associated with *U. parvum* infection. The identification of risk factors provides the foundation for the development of prevention interventions.

In this study, clinical and behavioral factors were shown to be significantly associated with the risk for infection. Based on this finding, it is evident that a single prevention strategy will not be sufficient, what will be needed is a combination prevention strategy for this vulnerable population. STI risk reduction counselling will also need to be strengthened in this population since the majority of the women are not using condoms during sex and a high proportion of women are presenting with symptoms of STIs.