

# Sexual Behaviour, STIs and risk of Prostate Cancer in Jamaican men: A case-control study

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# Background

- PCa is the most common cancer affecting J'can men at 78.1/100,000/yr
- It is also the leading cause of male cancer-related deaths
- The reasons for the high PCa incidence and mortality rate are unknown
- Studies done elsewhere inconsistently demonstrate an association between sexual behaviour, STIs and PCa

## Table of some prior studies on STIs & Prostate Cancer

Author	Year	Study	Germ	OR/RR (95%CI)	Ass
Hayes et al	2000	Case-control	GC/ TrP	1.6 (1.2-2.1)	+
Rosenblatt et al	2001	Case-control	GC	1.5 (1.0-2.2)	+
Fernandez et al	2005	Case-control	H/O VD	1.7 (1.1-2.5)	+
Taylor et al	2005	Meta-analysis	Any STI	1.48 (1.26-1.73)	+
Sutcliffe et al	2006	Prospective	GC/TrP	1.04 (0.79-1.36)	No
Dennis et al	2009	Nested C-C	HSV-2	1.60 (1.05-2.44)	+

# Background

- Sutcliffe et al (2006) → difference in results between case-control & cohort studies:
  - Recall Bias
  - Interviewer Bias

# Background

- In Ja. 18% of the male population has had at least 1 STI and 41% have had  $\geq 2$  sexual partners in the last year
- If STIs and/or sexual promiscuity are associated with PCa, could this explain the high incidence in Jamaica
- A clinic and hospital-based case-control study was done to explore the association between sexual behaviour, STIs and PCa

# Aim of study:

To determine if prostate cancer risk is associated with interpersonal sexual practices, STIs and condom use

# Objectives:

To determine if:

1. Lifetime number of sexual partners
  2. Age at first coitus
  3. History of one or more STIs
    1. Gonorrhoea
    2. Syphilis
    3. Genital sore
  4. Regular condom use,
- are associated with prostate cancer in Jamaica

# Methods

- March 2005 – July 2007
- Enrolled eligible, consecutive men, 40-79 years, at the UHWI, KPH, and 3 private urologists offices
- Unmatched case–control study examining the effects of diet and lifestyle on PCa
- Approved by the UWI FMS & MOH Ethics committees
- Informed consent



# Methods: Case and Control Definitions

- A case was defined as a man 40-79 years old with newly diagnosed, histologically proven PCa
- A control was a man 40-79 years with normal DRE assessed by a urologist and  $PSA < 2\text{ng/ml}$  or  $2\text{ng/ml} < PSA < 4\text{ng/ml}$  and F/T PSA ratio  $> 15\%$

# Methods: Exclusion criteria

- Men on 5<sup>α</sup>-RI (finasteride/dutasteride)
- Men with rapid weight loss
- Men on steroid hormone/ADT
- A history of prior prostate surgery
- Metastatic prostate cancer was suspected

# Methods

- Questionnaires administered before patients knew their diagnosis
- Interviewers were 'blind' to specific *a priori hypotheses* to minimise interviewer bias
- Blood drawn for PSA measurement
  - Micro-particle enzyme immunoassay (Abbott IMX)
- Patients biopsied in standard fashion
- A single study review pathologist

# Methods: Variables of interest

- Demographic
- Socioeconomic
- Diet
- Lifestyle
  - Smoking, physical activity, alcohol intake, etc
- Sexual behaviour
  - Age at first coitus, lifetime # of sex partners, # of sex partners in the last 12 mo, coital frequency in last 12 mo, sex with prostitutes, condom use
- STIs: Gonorrhoea, syphilis, genital sore

# Methods: Sample size and analysis

- 440 participants were required for 90% power at  $\alpha=0.05$ , to detect a 30% difference and with an anticipated 20% dropout rate
- Baseline characteristics of cases and controls compared
- Unconditional logistic regression (OR 95%CI)
- *P* of 0.05 used for level of significance
- STATA® v.8

# Results

# Results

- 519 participants
  - 244 cases
  - 275 controls
- Controls were significantly younger than cases ( $p=0.0001$ )
- Controls were better educated than cases ( $p=0.012$ )
- No difference in F/H, physical activity, union status, BMI, smoking

## Distribution of general characteristics of participants by case and control status

Patient Characteristics (N=519)	Cases (n=244)		Controls (n=275)	Odds ratio	95%CI	<i>P Value</i>
	No. (%)		No. (%)			
Age Categories (n=510)						
<50	3 (1.2)		46 (17.1)			
50-59	36 (14.9)		55 (20.5)			
60-69	81 (33.6)		87 (32.3)			
>70	121 (50.2)		81 (30.1)	1.82	1.52-2.17	0.0001*
Fam. Hx.of PCa (n=517)						
No	203 (83.9)		244 (88.7)			
Yes	39 (16.1)		31 (11.3)	1.51	0.91-2.52	0.109
BMI categories (n=462)						
<25	116 (55.8)		127 (50)			
25-29.9	67 (32.2)		94 (37.0)			
>30	25 (12.0)		33 (13.0)	0.87	0.67-1.13	0.304
Education level (n=499)						
Primary	215 (90.7)		211 (80.5)			
Secondary	12 (5.1)		37 (14.1)			
Tertiary	10 (4.2)		14 (5.3)	0.64	0.45-0.91	0.012*
Union Status (n=501)						
Married/Cohab.	150 (62.8)		168 (64.1)			
Other	89 (37.2)		94 (35.9)	1.06	0.74-1.53	0.752
Exercise Activity (n=498)						
None	88 (37.1)		110 (42.2)			
< 1/week	10 (4.2)		8 (3.1)			
1-2/week	13 (5.5)		31 (11.9)			
≥ 3/week	126 (53.2)		112 (42.9)	1.10	0.97-1.25	0.130



# Results of Bivariate or unadjusted analysis

- Prostate cancer was associated with:
  - # of sexual partners in previous year ( $p=0.01$ )
  - Coital frequency in previous year ( $p=0.011$ )
  - Condom use with regular partner ( $p=0.014$ )
  - Condom use with non-regular partner ( $p=0.008$ )
- Prostate cancer was not associated with:
  - Lifetime no. of sexual partners ( $p=0.314$ )
  - Age at first coitus ( $p=0.483$ )
  - Sex with prostitutes ( $p=0.622$ )
  - STIs ( $p=0.635$ )

Sexual Characteristic	Cases (N=244)		Controls (N=275)	Odds ratio*	95%CI	P Value
Lifetime no. of sex partners (n=498)	No. (%)		No. (%)			
0 (baseline)	2 (0.8)		1 (0.4)			
1-2	7 (2.9)		9 (3.5)			
3-6	65 (27.3)		60 (23.1)			
7-14	58 (24.4)		64 (24.6)			
≥ 15	106 (44.5)		126 (48.5)	0.91	0.75-1.10	0.314
No. of sex partners in last year (n=498)						
0 (baseline)	71 (29.8)		47 (18.1)			
1	118 (49.6)		142 (54.6)			
2	21 (8.8)		29 (11.2)			
3-6	25 (10.5)		40 (15.4)			
≥ 7	3 (1.3)		2 (0.8)	0.79	0.65-0.94	0.01
Coital frequency in last year (n=444)						
0 (nil) (baseline)	47 (21.7)		24 (10.6)			
< 1/month	52 (24.0)		65 (28.6)			
1-3/month	68 (31.3)		66 (29.1)			
1-3/week	42 (19.4)		62 (27.3)			
≥ 4/week	8 (3.7)		10 (4.4)	0.80	0.68-0.95	0.011
Sex with prostitute (n=437)						
No (baseline)	174 (81.7)		187 (83.5)			
Yes	39 (18.3)		37 (16.5)	1.13	0.69-1.86	0.622
History of STI (n=497)						
No (baseline)	98 (41.3)		113 (43.5)			
Yes	139 (58.7)		147 (56.5)	1.09	0.76-1.56	0.635
Uses condom with regular partner (n=499)						
Never (baseline)	183 (77.2)		181 (69.1)			
Sometimes	49 (20.7)		65 (24.8)			
Always	5 (2.1)		16 (6.1)	0.67	0.48-0.92	0.014
Uses condom with non-regular partner (n=493)						
Never (baseline)	129 (55.4)		115 (44.2)			
Sometimes	76 (32.6)		97 (37.3)			
Always	28 (12.0)		48 (18.5)	0.72	0.56-0.92	0.008

# Results: confounding variables

- Participant age
- Educational attainment

Both confounded the association between exposures of interest and prostate cancer

# Results

- After adjusting for age and education, none of the sexual factors were associated with prostate cancer

# Results: Crude and age-adjusted Odds Ratios (95%CI) for effect of sexual factors on Prostate cancer

Variable	Crude OR (95%CI)	Age-adjusted OR (95%CI)	LRT <i>p value</i>
Sexual partners in last year	0.78 (0.65-0.94)	0.95 (0.78-1.17)	0.0001
Coital frequency in last year	0.80 (0.68-0.95)	0.92 (0.76-1.11)	0.0001
Condom use with reg. partner	0.66 (0.47-0.92)	0.88 (0.61-1.28)	0.0001
Condom use with non-reg. partner	0.72 (0.56-0.92)	0.86 (0.66-1.13)	0.0001

Table 3 Crude and adjusted odds ratios for the effect of sexual factors on prostate cancer from logistic regression output

Variable	Crude OR (95%CI)‡	Age-adjusted OR (95%CI)‡	LRT $p^*$ value	Age & education-adjusted OR (95%CI)‡	LRT $p$ value†
No. of sexual partners in last year	0.78 (0.65-0.94)	0.95 (0.78-1.17)	0.0001	0.98 (0.79-1.21)	0.152
Coital frequency in last year	0.80 (0.68-0.95)	0.92 (0.76-1.11)	0.0001	0.93 (0.77-1.14)	0.426
Condom use with regular partner	0.66 (0.47-0.92)	0.88 (0.61-1.28)	0.0001	0.90 (0.62-1.31)	0.246
Condom use with non-regular partner	0.72 (0.56-0.92)	0.86 (0.66-1.13)	0.0001	0.87 (0.66-1.14)	0.107

\*Represents likelihood ratio test statistic  $p$  value for inclusion of age in the model

†Represents likelihood ratio test statistic  $p$  value for inclusion of education in model after inclusion of age

‡95% confidence interval

# Conclusions

- Sexual behaviour, STIs and condom use are not associated with prostate cancer in Jamaican men
- Consistent with the findings of most prospective studies

# Future

- Prospective study which provides more robust evidence
- Histories (STIs and behaviours) and Serum collected at baseline for evidence of exposure to STI
- Follow men over time
- Compare men who develop prostate cancer with those who do not



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