A new explanation for rising rates of anal cancer

A SYNDEMIC INTERACTION

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ANAL CANCER RATES ARE RISING IN MEN AND WOMEN WORLDWIDE

Source: Australian Institute of Health and Welfare

CO-FACTORS REPORTED WITH DEVELOPMENT OF ANAL CANCER

- Sexual intercourse before the age of 30
- Receptive anal sexual intercourse
- Lifetime number of sexual partners
- Female gender
- Current cigarette smoking
- Immune suppression after organ transplantation
- HIV infection
- Anal fistulae & epithelial trauma

Genital wart related associations
- Patients with GW have significantly increased risk of anal cancer & other cancers e.g. head & neck cancers
- Anal warts- cancer seen to arise out of anal warts
- Persistence of HrHPV in Danish women with genital warts
THE ROYAL PERTH HOSPITAL SURGICAL DATABASE : HIGH RATES OF HSIL IN WARTS

Established 1996

- a surgical data base of patients treated for anal warts in theatre
- epidemiological & histological data collected prospectively
- findings previously reported\(^1,2\)
  - 52% high-grade in males with HIV
  - 20% high-grade in males without HIV
  - HIV rates of AIN at least double that of HIV negative population

This study: 261 men; 53 women

- The majority of men (75%) were HPV positive compared with 40% of the women
- 80% of the MSM (most of the men) were HPV positive compared with only 47% of heterosexual men
- 40% of the men were HIV positive and HIV was strongly associated with HPV infection
- HPV positivity was associated with 6.5X increased risk of HSIL
WHAT IS A SYNDEMIC?- THE WIKEPEDIA DEFINITION

• ‘A **syndemic** or **synergistic** epidemic is the aggregation of two or more concurrent or sequential **epidemics** or disease clusters in a population with biological interactions, which exacerbate the **prognosis** and **burden of disease**.

• The syndemic approach departs from the biomedical approach to diseases to diagnostically isolate, study, and treat diseases as distinct entities separate from other diseases and **independent** of social contexts.’

The term was developed by Merrill Singer in the mid-1990s. Syndemics develop under health disparity, caused by poverty, stress, or structural violence and are studied by epidemiologists and medical anthropologists concerned with public health, community health and the effects of social conditions on health.

1 Tsai AC, Mendenhall E, Trostle JA, Kawachi I. Co-occurring epidemics, syndemics, and population health. The Lancet 2017;389:978-82
2 https://en.wikipedia.org/wiki/Syndemic doi 20170905
Variables included in the structural equation model showing the path to high-grade intra-epithelial neoplasia

**INDEPENDENT** variables:
- Warts and high-risk HPV
- HIV
- HSV2
- Gonorrhoea
- Chlamydia
- Hepatitis B infection
- Hepatitis C

**COVARIATES:**
- Increasing age
- Males compared to females
- MSM & BSM compared to heterosexual
- Number of sexual partners
  - (1-10, 11-49, 50 plus)
High Grade AIN AS A SYNDEMIC OF STI’S AND OTHER COFACTORs

Squares indicate observed variables and ovals indicate unobserved latent variables.

Arrows show hypothetical relationships established by this study.

Values show the odds ratio and $p$-values for each association indicated by an arrow.
How can STI’s act to increase the risk of HSIL?
Increasing rates of STI’s?

- Chlamydia-persistence of HrHPV
- Gonorrhoea-inflammatory extracellular reaction
- HSV2- a known mutagen, enables uptake of HPV
- Syphilis-other evidence for cancer association

Gonorrhea
Syphilis
Herpes Simplex Virus Type 2
HIV
HBV
HCV

Data courtesy HDWA Kellie Mitchell and Byron Minas
Source: Epidemiology and Surveillance Program, Communicable Disease Control Directorate
Syndemic synergy of HPV and other sexually transmitted pathogens in the development of high-grade anal squamous intraepithelial lesions

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