

Cytology and PCR as diagnostic tools for Female Genital Schistosomiasis in a population of young women aged 16-21years from rural South Africa.

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Female burden of Schistosomiasis

Africa 200 million women and girls at risk

- Exposure to infected water
- Female Genital Schistosomiasis (FGS): Contact bleeding, cervical lesions¹

Other possible confounders

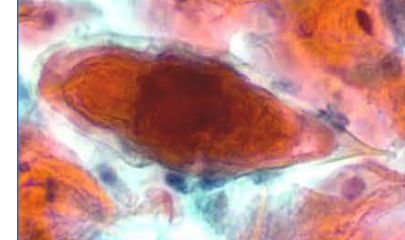
- Age of sexual onset (mean 16, range 15-24)²
- Unplanned sex
- Increased risk for STI's and HIV
- Teenage pregnancy (30% ever been pregnant, 13-19)

FGS DIAGNOSIS

- Host response to parasite eggs lodged in genital tissue
- Possible ↑ mucosal susceptibility to HIV and cervical atypia.
- Biopsies most accurate diagnostic for FGS;
- ≠ in a young population also at risk for HIV.

FGS DIAGNOSTIC TOOLS

- Cytology Pap smears- low sensitivity for parasite eggs ³



- Urine microscopy- indirect indicator, not a pure marker for FGS (diagnostic errors, low sensitivity, varied egg excretion) ^{4,5}



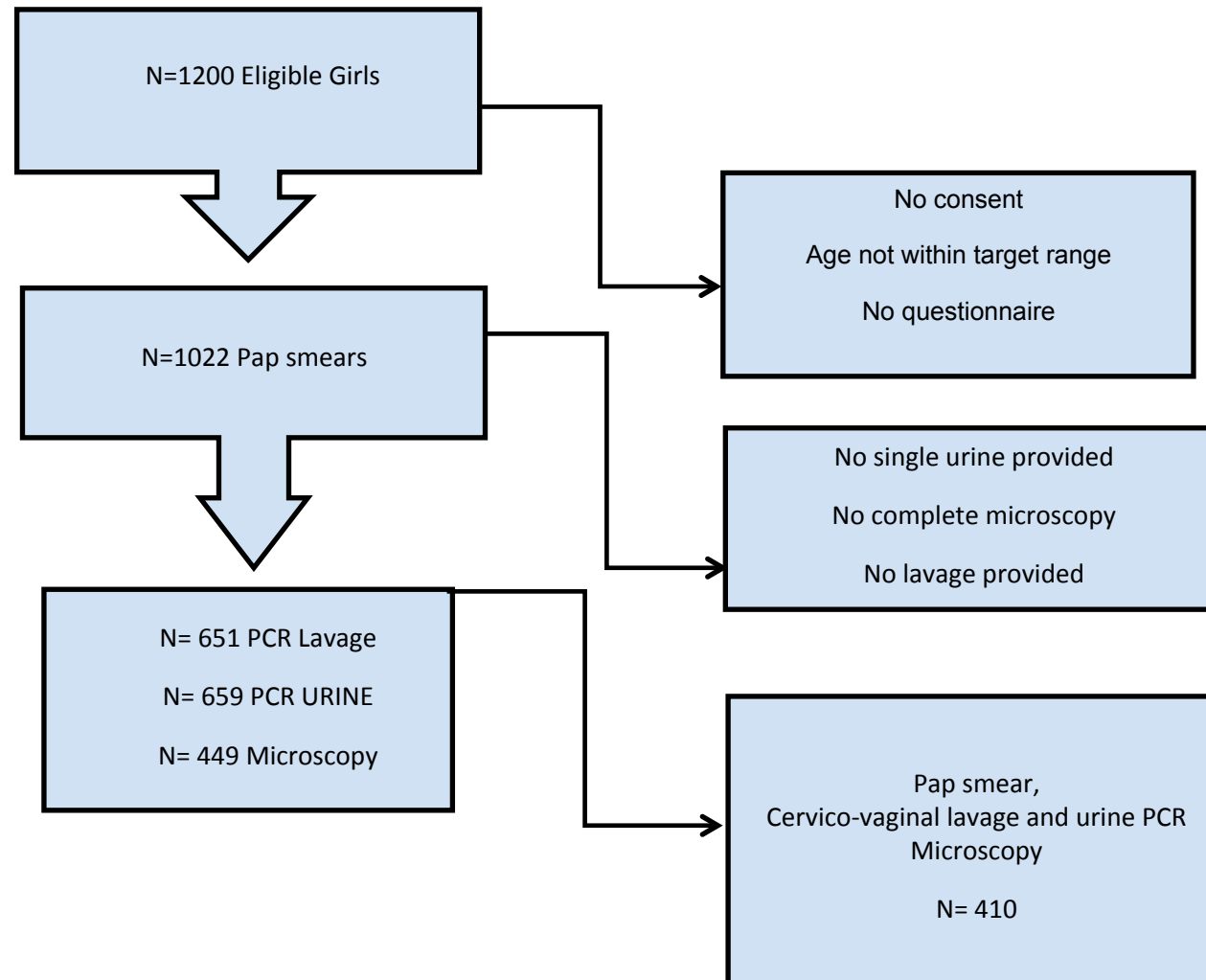
- Urine and Lavage PCR: specificity  100%
- Sensitivity  microscopy ⁶



KZN FGS STUDY

- Young women aged 16-21
- High schools
- Ethical clearance
- Sampling
 - Questionnaire
 - Single urine collected (Microscopy and PCR)
 - Gynae examination (cervico-vaginal lavage and Pap smear)

Study Participation



Cytology

- Conventional Pap smears
- Papanicolaou staining
- Reported using the Bethesda System
- Various cytological entities
- Review of cases
- Quality control -rapid rescreening of all negative smears

Diagnostic Performance

	<i>N (410)</i>	% pos
Microscopy Urine	81	19.8
PCR Urine	93	22.7
PCR Lavage	39	9.5
Cytology Pap smear: Schistosomiasis	8	2.0
Cytology Pap smear: Squamous cell atypia (SCA)	115	28.0

Cytology results compared to PCR and Microscopy

<i>n</i>	Pap Cytology	Lavage PCR	Urine Microscopy	Urine PCR
1	POS	POS (19.5)	POS (75 eggs)	POS (23.8)
2	POS	POS(28,3)	POS (40 eggs)	POS(20.6)
3	POS	POS(28.6)	POS (21 eggs)	POS(26.6)
4	POS	POS (23.0)	POS (15 eggs)	POS (32.9)
5	POS	POS (21.9)	POS (13 eggs)	POS (34.0)
6	POS	POS (25.4)	NEG	POS (22.3)
7	POS	POS(21.9)	NEG	POS (22.3)
8	POS	POS (27.20)	NEG	NEG

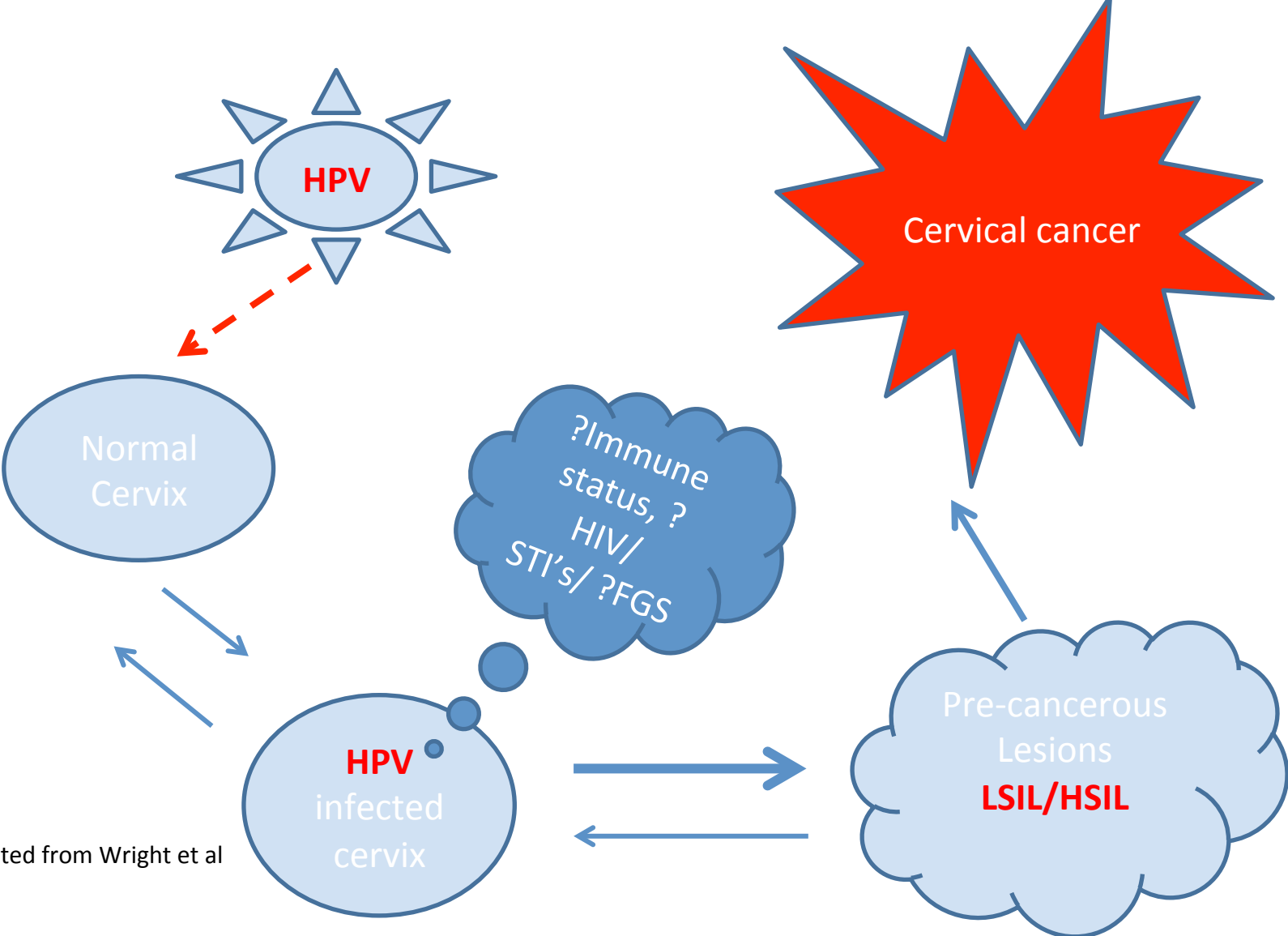
Results

- PCR lavage - gold standard
- PCR lavage- 6 x more positive cases than Paps
- Pap sensitivity = 21% & specificity =100%

Cytology Results

- Squamous cell atypia -115/410 (28.0%)
- Not significantly associated with ***Schistosoma*** diagnostic tests
- SCA in a young population- not conventionally screened
- Cervical cancer affects 1 in 41 women - South Africa

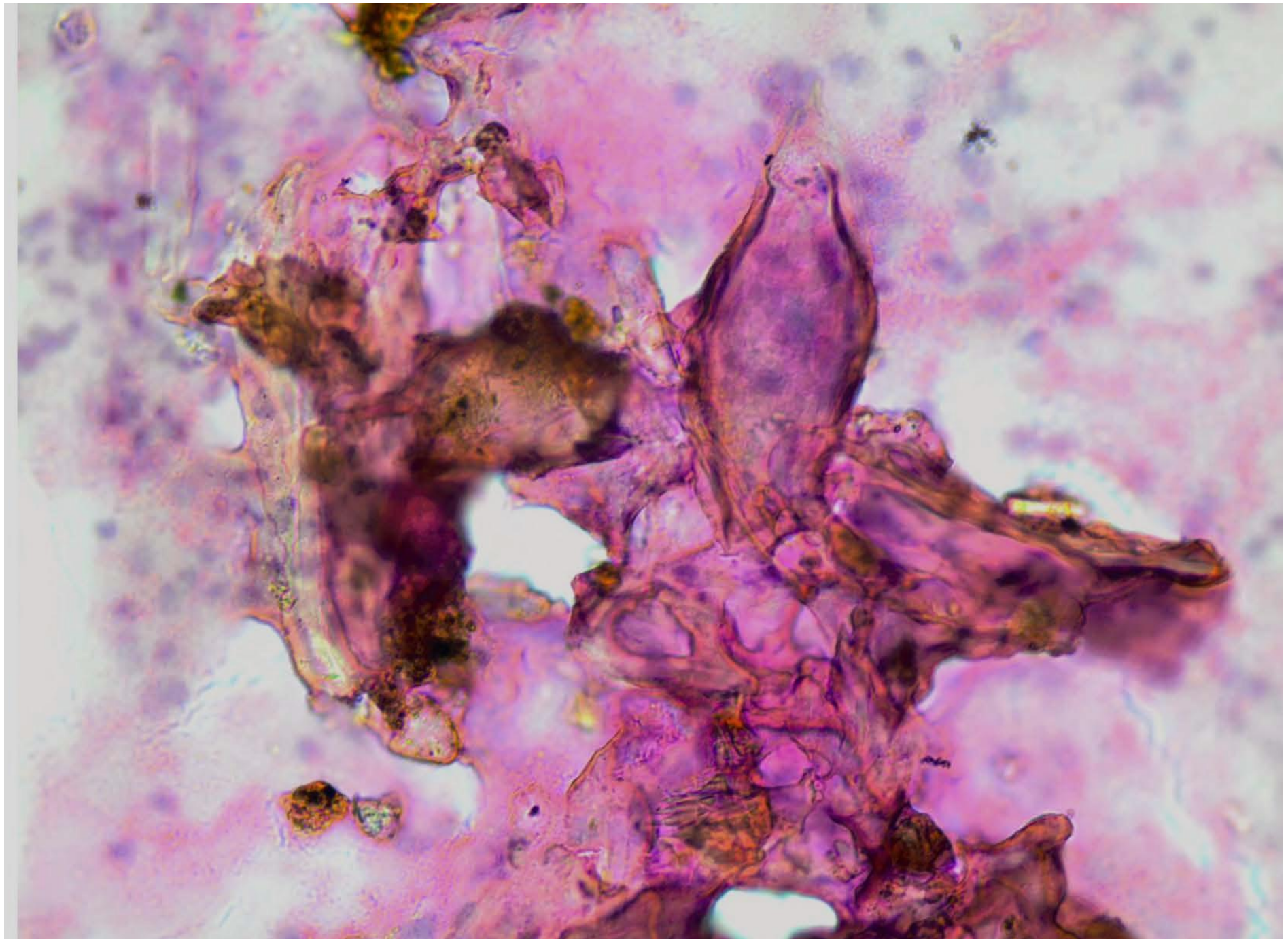
Development of Cervical Cancer

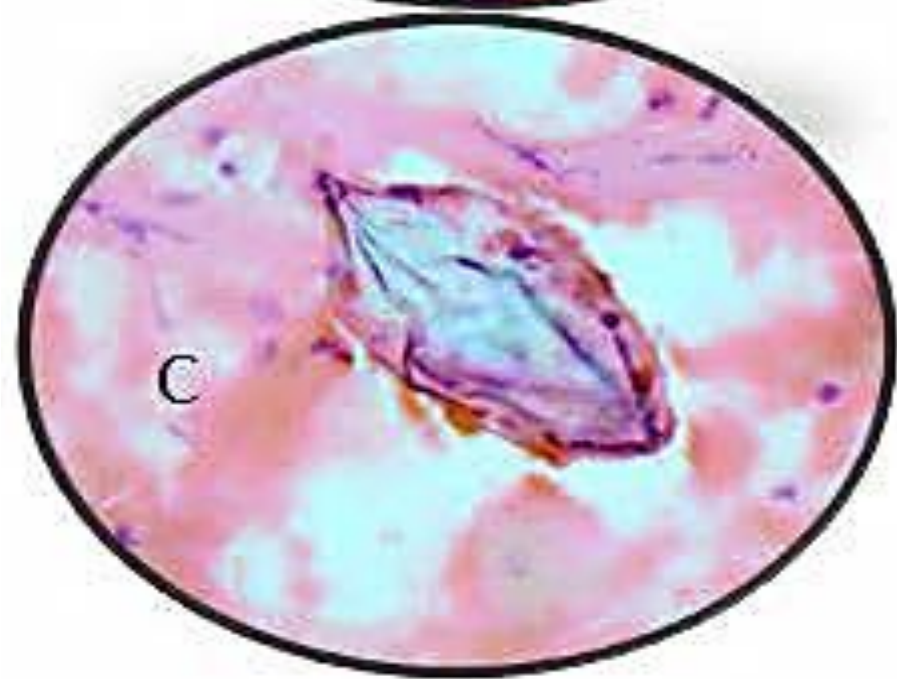
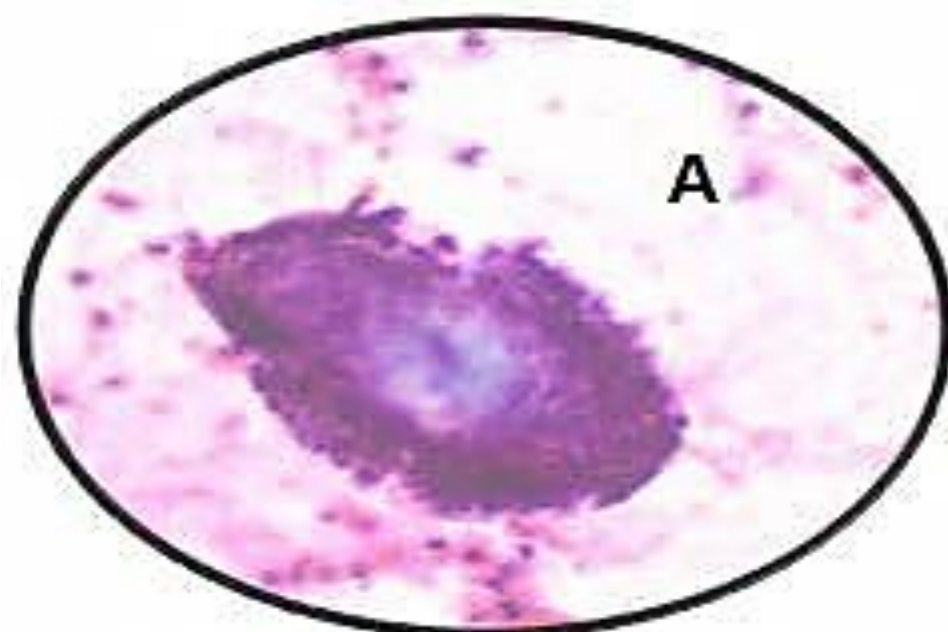


Adapted from Wright et al 2003

Cytology Diagnostic Challenges

- Sub-optimal Pap smears
 - Sampling Methodology
 - Suitability of trained personnel
 - Poor visibility of cells-blood/inflammation
 - High specificity for *Schistosoma*





Recommendations

- Diagnostic tests require careful consideration in resource poor settings
- Optimal collection and processing of specimens- is crucial
- Lavage PCR may be a useful indicator – alongside other clinical tests for FGS
- Long term outcome of SCA among a young population is of concern

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Thank you