

HPV Screening for Cervical Cancer in Rural India



Screening Clinic

Background

In October 1999, we began to measure the effect of a single round of screening by testing for human papillomavirus (HPV), cytologic testing, or visual inspection of the cervix with acetic acid (VIA) on the incidence of cervical cancer and the associated rates of death in the Osmanabad district in India.

Figure 1: Study location - Osmanabad district, India



Notional map showing Osmanabad district, Maharashtra, India

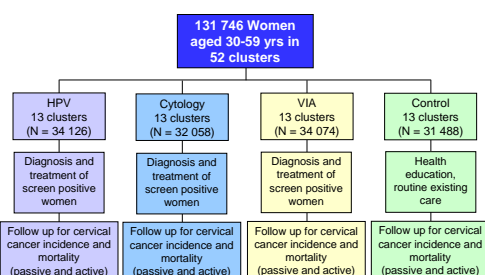
Objectives

- To evaluate the reduction in cervical cancer incidence and mortality associated with a single round of screening with HPV testing or cytology or visual inspection with acetic acid (VIA), as compared to a control group with no screening
- To evaluate the cost-effectiveness (CE) of the above three approaches

Methods

Women aged 30-59 years in 52 clusters of 497 villages in Osmanabad District, India, were randomised to a single round of screening by trained midwives with either HPV testing (N=34 126), cytology (N=32 058), VIA (N=34 074) or to a control group (N=31 488). All laboratory tests were performed locally. Test-positive women had further investigations (colposcopy/biopsy) and those with cervical precancerous lesions or cancer received appropriate treatment.

Figure 2: Study design



Results

Table 1: Participation and detection rates

Study group	HPV (N = 34 126)	Cytology (N = 32 058)	VIA (N = 34 074)
Screened	79.7%	79.7%	78.5%
Screen positives	10.3%	7.0%	13.9%
CIN 1 detection rate	2.2%	1.9%	5.3%
CIN 2/3 detection rate	0.9%	1.0%	0.7%

Table 2: Stage distribution (%) of cervical cancer

Study group (No of cervical cancer cases)	Stage			
	IA	IB	II+	Unknown
Control (118)	5.9	22.0	69.5	2.5
HPV (127)	37.0	26.0	30.7	6.3
Cytology (152)	39.5	19.1	38.2	3.3
VIA (157)	22.3	19.7	54.8	3.2

Figure 3: Number of incident cases and deaths from cervical cancer

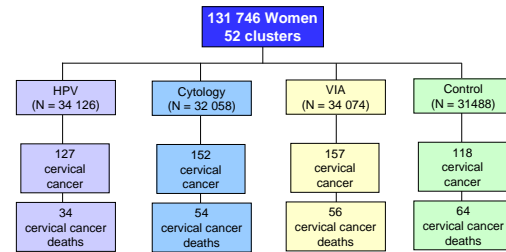


Table 3: Hazard ratios (HR) of incidence rate of stage II or worse cervical cancer and cervical cancer mortality

Study group	Incidence		Mortality	
	Rate/ 100 000	HR (95% CI)	Rate/ 100 000	HR (95% CI)
Control	33.1	1.00	25.8	1.00
HPV	14.5	0.47 (0.32-0.69)	12.7	0.52 (0.33-0.83)
Cytology	23.2	0.75 (0.51-1.10)	21.5	0.89 (0.62-1.27)
VIA	32.2	1.04 (0.72-1.49)	20.9	0.86 (0.60-1.25)

CI: Confidence interval

Figure 4: Cumulative cervical cancer incidence and mortality by period

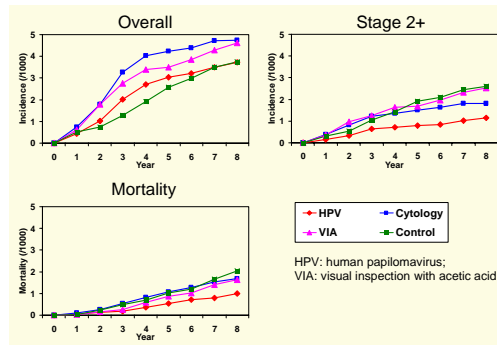


Table 4: Cervical cancer incidence rates among screen negative women by study group (2000-2007)

Study group	Cancer cases	Number of women	Age Standardized Incidence rate (per 100,000)
HPV	8	24 380	3.7
Cytology	22	23 762	15.5
VIA	25	23 032	16.0

Conclusion

In a low-resource setting, a single round of HPV testing was associated with a significant reduction in the numbers of advanced cervical cancers and deaths from cervical cancer.

Sankaranarayanan *et al.*, HPV screening for cervical cancer in rural India. *N Engl J Med.* 2009; 360(14):1385-94.

Acknowledgements:

The investigators gratefully acknowledge the generous support of the Bill & Melinda Gates Foundation through the Alliance for Cervical Cancer Prevention (ACCP). We thank the Ministry of Health, Government of Maharashtra, District Collector, District Zilla Parishad Chief Executive, District Health Officer of Osmanabad and civic administrations for their cooperation. We especially thank the women and their families for their participation.

