Opportunities, Challenges and Implications of m-Health Oral Cancer screening for HIV-positive individuals in India

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Poster #PEC278

Background

- Oral cancer accounts for 30% of all cancers in India, with an estimated 70,000 new cases and 48,000 oral cancer– related deaths annually

- Five year mean survival rate for oral cancer patients in India is estimated to be 5%-10% lower than the world mean—late presentation being a common cause for this observation

- People living with HIV/AIDS (PLWHA) have a 2-6 times higher risk for oropharyngeal cancers than the general population

- HIV-induced immunosuppression, higher prevalences of smoking, tobacco and alcohol use, oral HPV among PLWHA—are factors driving higher risk estimates

- India has the third highest number of PLWHA globally and tobacco use is estimated to be prevalent in 35% of the population

- Screening for oral cancer in Indian PLWHA is sparse and the current healthcare system congested and overburdened

- Accordingly, we evaluated a m-Health oral cancer screening pilot driven by non-medical healthcare workers

Setting and study population

- **Setting:** ART center of BJ Government Medical College & Sassoon General Hospitals Pune, India: a large, publicly funded hospital in western India

- **Study Population:** Adult (≥21 years) PLWHA, with no prior history of oral cancer who provided informed consent were enrolled between June 2017 and November 2017

Description and Lessons Learned

- Employing a validated oral cancer screening mobile application, two trained non-medical healthcare workers approached and enrolled participants attending the ART center for care

- A minimum of 8 photographs of different parts of the oral cavity, socio-demographic, risk factor including sexual and HIV histories were obtained and captured on electronic hand held devices

- Images were synced on to a cloud-based server, from where they were reviewed by at least 2 clinicians

- The study process flow has been summarized in Figure 1

Figure 1

OPMD: Oral potentially malignant disorders

Table 1: Characteristics of the study population	
	n (%)
Total number enrolled (N)	331
Median age (IQR)	40 (35 - 45)
Males	166 (50)
Median recent CD4 (IQR) (cells/mm^3)	529 (366—727)
Smoking	
Ever smoked	51 (15)
Currently smoke	7 (2)
Chewing tobacco	
Ever chewed	128 (39)
Currently chew	86 (26)
Alcohol	
Ever used	115 (35)
Currently use	7 (2)
Practice oral sex	50 (15)
Multiple sexual partners	96 (29)

- A total of 2648 images were reviewed, with 99% of the images deemed adequate for a clinical diagnosis

- 42 participants were deemed to have OPMD on image review—who were more likely to be older (p=0.01) and male (p=0.05)

- **Figure 2**: shows the number of participants who returned for follow-up and the number who were diagnosed to have OPMD on clinical review and provided standardized care

Figure 2

*Height of the bar graphs is not to scale

Number of participants enrolled — N=331
Number of participants with OPMD on image review — N=42 (36% decrease)
Number of participants returning for follow-up — N=27
Number of participants with OPMD on clinical review — N=14

Conclusion

- In a young HIV-positive cohort with high CD4 count the prevalence of oral cancer risk factors was high

- While OPMD were overdiagnosed on image review, m-Health provided an effective and rapid method of oral cancer screening, without congesting ART centers and overburdening healthcare providers, through selective in-person follow-ups

- Thirty-six percent of those diagnosed to have OPMD on image review did not return for follow-up—most commonly cited reason was that they were asymptomatic

- Although we describe a feasible method for oral cancer screening in India among PLWH, scaling it up will require better risk communication to improve participant follow-up

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Acknowledgments

Presented at the 22nd International AIDS Conference—Amsterdam, the Netherlands

AIDS 2018