



Original Research Article

Cervical cancer screening using liquid-based cytology (LBC) in a secondary care hospital in Northeast India

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ABSTRACT

According to the latest National Cancer Registry Programme (NCRP 2020) report, India had the highest incidence rate of cervical cancer (27.7 per 100,000) in Asia and also cervix uteri was the leading anatomical site of cancer in women population of Nagaland (16.4%). Lack of access to healthcare and awareness has led to the increased cases of cervical cancer, in particularly the resource-limited areas. A retrospective study involving 711 samples of cervical smears of women collected in the Department of Gynaecology were analysed between May 2019-May 2021 at CIHSR hospital. The objective of this study was to address this preventable cancer burden and also to determine a fraction of pap cervical smear finding through LBC in a secondary level hospital in Dimapur, Nagaland. 711 Pap smears using LBC technique were processed in the Department of Pathology of which 20 samples (2.81%) yielded unsatisfactory result or were rejected. Of the remaining 691 samples, 16.35% (113/691) had abnormal results. The Bethesda System (TBS-2014) for cervical cancer screening was used for classifying the categories, of which ASC-US was 48.67% (55/113), LSIL 7.96% (9/113), ASC-H 22.12% (25/113), High grade squamous intraepithelial lesion (HSIL) 17.69% (20/113), Squamous cell carcinoma 2.65% (3/113) and adenocarcinoma 0.88% (1/113). The chief complaints among women with abnormal cytology were pain in the lower abdomen (27.4%), white discharge per vaginum (22.1%) and bleeding per vaginum (15.0%). This study determines the first retrospective analysis of Pap smear finding through LBC in the state and highlights the deficiency of effective screening programme and testing facilities.

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1. Introduction

Cancer of the cervix uteri is the fourth most common cancer among women worldwide, with an estimated 604,000 new cases and 342,000 deaths worldwide. The majority of cases are squamous cell carcinoma followed by adenocarcinomas.¹ The National Cancer Registry Programme (NCRP) report containing 5-year data (2012-2016) was published in 2020 to assess the status and trends of cancer in India through standardized data collected from

population-based cancer registries (PBCRs) and hospital-based cancer registries (HBCRs) which is published by ICMR-NCDIR. The projected incidence of patients with cancer for the year 2020 in India in males is 679,421 and in females is 712,758.² A well representation of dissected data for NorthEast (NE) region in the registry indicates that NE region had the highest cancer incidence rate in both sexes. It was also observed that the Papum Pare district in the state of Arunachal Pradesh, has the highest incidence rate of cervical cancer (27.7 per 100,000) in Asia, while Aizawl district in Mizoram had the highest age-adjusted rate (AAR) (269.4) and mortality (152.7) rate among males.

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In NE females, the most common site was breast (14.5%) followed by cervix uteri (12.2%) and gall bladder (7.1%).³ Covering an area of 16,579 square km the state of Nagaland hosts a total population 19,78,502 with fourth-fifth of the population residing in isolated villages. During the period 2012-2016, NCRP covered two (Dimapur and Kohima) out of eight districts involving eight hospitals which registered at least one percent of all cases. The leading cause of cancer among women in Nagaland was cervical cancer with 16.4%.³ The burden of cervical cancer falls on the women who lack access to health services, mainly in low- and middle income countries⁴ and awareness about cervical cancer screening has now become the immediate need in resource-limited countries, including Nagaland.

2. Materials and Methods

From the period between May 2019 to May 2021, a retrospective record review was performed for a total of 711 women who were referred from Department of Obstetrics and Gynaecology at CIHSR hospital for Pap cervical smear to the Department of Pathology. Pap cervical smear sample was collected by trained personnel following the manufacturer's protocol for performing liquid based cytology (LBC) with SurePath (BD Diagnostics, United States) direct to slide method. The LBC technique successfully captures the complete cellular samples under a consistent, localized area thereby improving visualization, assessment and cellular preservation. Samples were processed and stained within 24 hours of receiving and the slides were reported by the pathologist following the latest Bethesda system of reporting (TBS 2014). Data on age, marital status of the patient, reproductive history and their current gynaecological symptoms (if any), date of Pap smear performed and the result were retrieved from the pre-filled proforma. After screening, all screened women collected their reports and were directed to the Department of Obstetrics and Gynaecology, to ensure that those with abnormal cytology were subjected to further necessary evaluations and treated appropriately.

3. Results

All samples (n=711) received in the pathology department were processed for cytological investigation through LBC, where 20 samples (2.81%) were rejected or yielded unsatisfactory result. Among the remaining 691 samples, it was observed that 16.35% (113/691) had abnormal results. The abnormal cervical cytology was classified according to the Bethesda System (TBS-2014). It was observed that among women with abnormal cytology (16.35%), majority of the cytology presented as ASC-US with 48.67% (55/113), LSIL 7.96% (9/113), ASC-H 22.12% (25/113), 17.69% (20/113) were High grade squamous intraepithelial lesion (HSIL), while 2.65% (3/113) were Squamous cell

carcinoma and adenocarcinoma stood at 0.88% (1/113). (Table 1). The abnormal smears were however not subjected to HPV testing due to unavailability of resources.

Table 1: Abnormal cytology classification (n =113)

Cytology category	Abnormal n (%)
Malignant	4
HSIL	20
ASC-H	25
LSIL	9
ASC-US	55

HSIL, High-grade squamous intraepithelial lesion; LSIL, Low-grade squamous intraepithelial lesion; ASC-H, Atypical squamous cells- cannot exclude high-grade squamous intraepithelial lesion; ASC-US, Atypical squamous cells- undetermined significance.

The chief complaints among women with abnormal cytology were pain in the lower abdomen (27.4%), white discharge per vaginum (22.1%) and bleeding per vaginum (15.0%). Among women with abnormal cytology the mean age was 40 years. However, there was no significant correlation between chief complaints and cytology category. The details of the women screened, the frequency of cytological abnormalities and the most common complaints have been enlisted in Table 1 and Table 2 respectively. Our study also indicated that 22.12% of women who had abnormal cytology came to the hospital seeking routine cervical cancer screening.

Table 2: Common complaints among screened positives (n=113)

Complaints	Abnormal n (%)
White discharge	25 (22.12)
Pain lower abdomen	31 (27.43)
Routine	25 (22.12)
Postmenopausal bleeding	8 (7.08)
Menorrhagia	5 (4.42)
Prolapse	4 (3.53)
Spotting	9 (7.96)
Irregular periods	6 (5.30)

4. Discussions

The use of liquid based cytology is a recent screening tool in this part of the state. Nagaland have not in the past conducted any large scale population based cervical cancer screening which could be one of the factors for the higher incidence of Cancer cervix in this region with only a few private clinics and hospitals performing conventional pap test on request. This technically achievable and cost-effective screening should have a wider reach to the marginalized inhabitants of this region.

Despite the hospital not having a specific cervical cancer clinic, this review highlights that 22.12% of the women

with abnormal cytology came to the hospital seeking routine cervical cancer screening. Hence screening of even asymptomatic women is recommended for this particular region. In our study done in a semi urban area, the proportion of Squamous intraepithelial lesion (SIL) was 7.59% in a sample size of 711 over two years. Similar study done in Maharashtra of two-year period on 680 samples showed SIL of 10.88%.⁵ One study in a hospital based setup in Madhya Pradesh compared the results in urban and rural areas. They found out that there was higher percentage of SIL in rural 10.5% as compared to 4.5% SIL in urban.⁶ Another hospital based Cervical screening done over 1 year with sample size of 1650 showed 5.57% SIL.⁷ When compared with a study done over 35 years in a hospital based cytological screening in Lucknow revealed a proportion of 7.2% SIL in 36,484 samples which was comparable to our study.⁸ However, the duration and the number of test and the population screened may not be representative of the state of Nagaland as the hospital also caters to patients from neighbouring state of Assam and Manipur. When it comes to the general population, the proportion of women (aged 30-49) who have undergone screening was 0.3% for both breast cancer and cervical cancer.³ This forms a relevant ground to not only conduct mass sensitization for better health-seeking behaviour but also to establish a systematic screening clinic in hospital settings to intervene at population level as well through community oriented screening programs. One of the limitations in tackling this problem is the lack of larger representative data which will highlight key social and economic factors for planning and delivering a large scale health service. Additionally, with health insurance scheme or financing scheme coverage as low as 20.5% in the state, less than a quarter of the Nagaland population remains devoid of access to quality healthcare. When it comes to accessing specialized treatment, due to lack of required infrastructure and skilled human resources, a substantial number of the population have to travel outside the state and beyond the region for treatment, incurring addition financial burden.^{3,9}

In the Seventy-third World Health Assembly, a resolution was made for the global strategy to eliminate cervical cancer as a public burden by accelerating interventions and prioritizing vaccination and screening for the period 2020-2030.⁴ WHO recommends different models for Cervical cancer screening with 'HPV only' as more widely accepted in high income countries and 'PAP triaging with HPV' more suited for lower income regions with specific 2030 targets. HPV testing in this region is still not routinely done due to lack of testing facilities and high cost which is one of the main problem in following national and international recommendations. Strong association is linked between high-risk Human papillomavirus (Hr-HPV) infection and cervical cancer. HPV cervical infection

results in cervical morphological lesions ranging from normalcy (cytologically normal women) to different stages of precancerous lesions (CIN-1, CIN-2, CIN-3/CIS) and invasive cervical cancer.^{10,11} Although automated platforms for HPV detection are commercially available, they are not suitable in a large scale screening program in low resource settings mainly due to their high price. Low-cost PCR-based techniques and kits are available, but the approach is not standardized and requires high-skilled manpower in a molecular set-up. The lack of HPV testing in the region is one major factor for standardising treatment. The genotype prevalence and variation in the population is non-existent which otherwise would have guided towards better vaccine choice. Roll-out of approved HPV vaccines in immunisation programmes would be key in eliminating the burden. The Federation of Obstetric & Gynecological Societies of India (FOGSI) recommends two FDI approved vaccines; the Bivalent (Cervarix, GSK) and Quadrivalent (Gardasil, Merck) preferred to be administered under the age group of 9 - 14 years. For screening, triaging and management of cases, the federation recommends exercising the most optimum approach according to resource availability and comprehensive follow-up and treatment.¹²

Cervical cancer is one of the preventable cancers and when diagnosed early is one of the most successfully treatable forms of cancer.¹³ The current statistics designates a long term medical negligence which warrants immediate interventions for eliminating this disease burden. Moving towards the 2030 UN Sustainable Development Goals (SDGs), the healthcare professionals, researchers, administrators and the public also need to commit towards better women health to attain a universal health coverage, leaving no one behind.

5. Conclusion

Lack of access to healthcare and infrastructure has led to increase cases of cervical cancer, in particular the state of Nagaland. Currently, there is no available data regarding screening for cervical cancer in Nagaland which is a grave public health concern. The result from this retrospective analysis was to address the disease burden through representative data, highlight the need of effective screening programme and availability of HPV testing for uniformity of management and treatment according to the national recommendations.

6. Source of Funding

None.

7. Conflict of Interest

The authors declare no conflict of interest.

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