ORIGINAL ARTICLE

Ann Acad Med Singap 2021;50:135-40
https://doi.org/10.47102/annals-acadmedsg.2020293

Cervical screening in foreign domestic workers in Singapore

Julia CL Eng, [1]*MN(Onco)*, Joyce BT Er, [2]*MN*, Carrie SY Wan, [3]*BBMedSc*, YK Lim, [3]*MBBS*, Ida Ismail-Pratt, [4,5]*MBChB*, Joseph SY Ng, [4,5]*MD*

ABSTRACT

Introduction: Globally, cervical cancer is the fourth most common cancer in women, with about 85% occurring in low-middle income countries (LMIC) and an age-standardised incidence rate of more than 15 per 100,000. It is largely preventable through HPV vaccination and cervical cancer screening. In Singapore, 18% of the foreign domestic workforce hail from Indonesia, the Philippines, Myanmar, and India. However, there is no data on preinvasive cervical disease and cervical cancer in foreign domestic workers (FDWs) and the aim of this pilot programme is to determine the baseline screen positive rate of high-grade intraepithelial in this population.

Methods: A total of 322 FDWs were offered HPV screening through the Helping Our Helper (HOH) pilot programme. Data from this pilot programme were analysed and reported using simple descriptive statistics.

Results: Out of the 322 FDWs who registered for HPV screening, 68.6% participated. There was a 22.2% screen-positive rate; 10% of those who screened positive for high-risk HPV had histologically confirmed high-grade cervical intraepithelial neoplasia. This result is similar to other data on cervical cancer screening in Singaporeans. This pilot project screened less than 1% of the eligible FDWs in Singapore.

Discussion: The findings of this pilot programme suggest that there is public health value in providing cervical cancer screening to FDWs. Improving cervical cancer screening by increasing awareness and including routine cervical cancer screening as part of the employment medical examination should be studied.

Ann Acad Med Singap 2021;50:135-40

Keywords: Cervical cancer, CIN 2, colposcopy, HPV, HSIL, LSIL

INTRODUCTION

Cervical cancer is the most common gynaecological cancer in many countries in Southeast Asia, with a cumulative age-standardised incidence rate (ASRI) of 17.2 per 100,000 and a corresponding mortality rate (ASMR) of 10 per 100,000.[1] In Singapore, cervical cancer is the 10th most common cancer in women with an ASRI of 7.1 per 100,000 and ASRM of 2.3 per 100,000.[2] However, in developing countries like Indonesia, Myanmar and the Philippines, cervical cancer remains high with ASRI of 14.9 to 23.4 per 100,000 and ASMR of 8.8 to 13.9 per 100,000.[3] This is likely related to the lack of awareness, screening and cervical cancer prevention programmes in these countries. In Southeast Asia, the average screening coverage in developing countries is only 19%, with Myanmar at less than 1%.[4] In another recent study by Anwar et al. on participation of screening among Indonesian women, it was found that only 14% of women had cervical screening and 20% were aware of a Pap smear.[5] In Singapore, foreign domestic workers (FDWs) make up 18% of the non-resident workforce. The assumption is that these women have the same baseline risks as women in their home countries, but there is no published data that addresses this assumption and therefore the need for cervical cancer screening in this population.

[1] Division of Nursing, KK Women's and Children's Hospital, Singapore
[2] Division of Nursing, Alexandra Health Pte Ltd, Singapore
[3] Division of Obstetrics and Gynaecology, Department of Gynaecology Oncology, KK Women's and Children's Hospital, Singapore
[4] Department of Obstetrics & Gynaecology, National University Health System, Singapore
[5] Yong Loo Lin School of Medicine, National University of Singapore, Singapore
Correspondence: Ms Julia Eng, Division of Nursing, KK Women's and Children's Hospital, 100 Bukit Timah Road, Singapore 229899.
Email: Julia.eng.cl@kkh.com.sg

CLINICAL IMPACT

What is New

- This pilot study is the first to highlight the epidemiological need to screen women working as foreign domestic workers in Singapore for cervical cancer.
- Findings underscore the potential disease burden in this population.

Clinical Implications

- The study supports the need to increase the awareness of and access to cervical cancer screening in women who work as foreign domestic workers in Singapore.
- This data can potentially help policy-making and guide efforts to improve the health and productivity of such workers in Singapore.

The objective of this paper is to: (1) determine a baseline screen positive rate in age-appropriate FDWs in Singapore and therefore the baseline 5-year cervical cancer risk in this population; (2) determine the baseline screen positive rate for high-grade intraepithelial lesions and therefore the utility of cervical cancer screening in this population; and (3) share data that will help inform policy and guide efforts to improve the health and productivity of FDWs in Singapore.

METHODS

This is a retrospective review of the medical records of FDWs who attended the Helping Our Helpers (HOH) cervical screening programme of the Society for Colposcopy and Cervical Pathology of Singapore (SCCPS) at the National Cancer Institute Singapore (NCIS), and KK Women's & Children's Hospital (KKH). This programme was a pilot social outreach initiative of the SCCPS to increase awareness of cervical cancer prevention in this group of women in Singapore. Cervical cancer screening was offered at no cost to women working as FDWs in Singapore. Data were collected from the programme that ran from September 2018 to August 2019. Primary human papillomavirus (HPV) screening was performed in accordance with national screening guidelines[6] using a single HPV DNA test (Cobas 4800 HPV DNA Assay, Roche Diagnostics, Basel, Switzerland). Only women between the ages of 30 and 70 were eligible. Women who were interested in the programme were given information about cervical cancer screening and counselled by the healthcare team. Estimated costs for cytology, colposcopy, and other possible outpatient treatment options that may follow a positive screening test were also provided and follow-up testing explained before the women decided on whether to proceed with testing. Consent for the screening test was taken and participants were recalled to inform them of results. Participants with positive screen were counselled for cytology triage and appointment for colposcopy. Participants who declined further investigation were given counselling for cervical screening (Fig. 1).

Data from both NCIS and KKH were pooled and analysed. The results were reported using simple descriptive statistics, looking primarily at positive HPV results. Results were further categorised by HPV subtypes. Possible positive screening results were categorised into women who had HPV 16 detected only (HPV 16), HPV 18 detected only (HPV18), non-16/18 pooled DNA detected only (non-16/18), and women who were positive for multiple strains.

The results of women who underwent cytology triage and attended colposcopy were analysed as well. Where available, histological results and a summary of follow-up treatments carried out in the programme were also analysed and reported.

RESULTS

Out of the 322 FDWs who registered for the programme, 226 (70.2%) attended their given appointments. Of these, 221 (68.6%) were screened after 5 women declined to proceed following the clinic pretest counselling session.

The FDWs screened were between the ages of 28 and 59 years with the median age being 41 years. They were mostly from the Philippines (78.7%) and Indonesia (13.6%) as outlined in Table 1. Forty-nine (22.2%) had a positive HPV DNA test. HPV non-16/18 was the most common result, contributing to about 70% of all positive results. HPV 16 and HPV 18 each made up 8% of the positive results. There were 6 who were positive for multiple HPV strains, making up about 12.2% of all women screened in the programme (Table 2).

All 49 women tested positive for HPV DNA test were recalled for further counselling on current recommendations for management of positive results. Thirty-two (65.3%) of them agreed to further management following counselling. Seventeen (36%) declined further follow-up as prescribed in the national screening guidelines. These women cited a wish to seek follow-up with medical professionals in their home countries or other providers not involved in the HOH

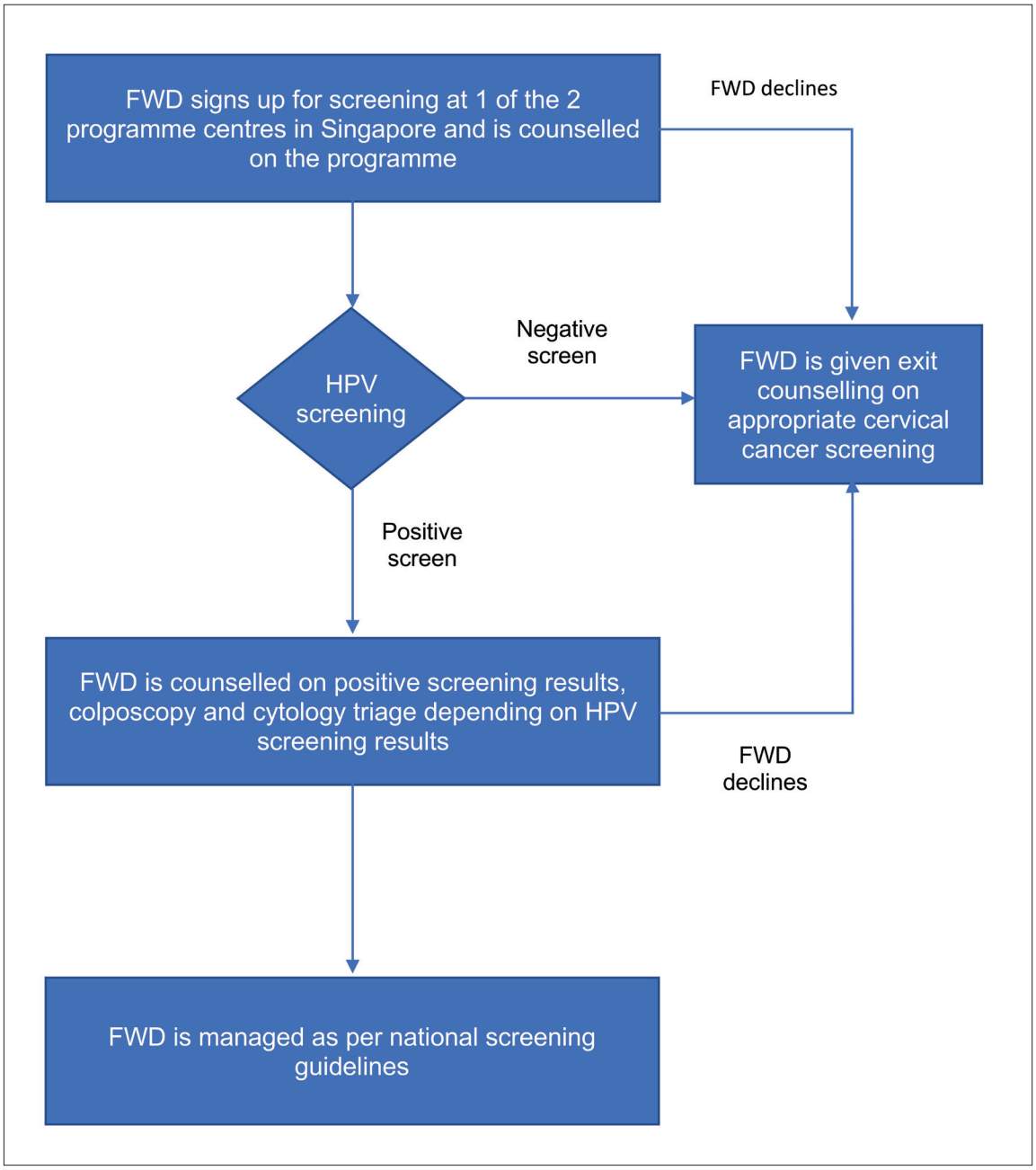

Fig. 1. Workflow for the Helping Our Helpers (HOH) programme.
FWD: Foreign domestic worker; HPV: human papillomavirus

programme. There was no subsequent follow-up for this group of women.

All women with positive HPV non-16/18 (35 out of 49) were offered further investigation; 22 (63%) agreed to cytology triage, and 1 agreed to only colposcopy. Twelve (55%) out of these 22 women had positive cytology triage results requiring further referral for colposcopy assessment. Only 4 of these 12 women agreed to undergo colposcopy while the rest declined. Those who had a negative cytology triage are invited for a repeat HPV DNA test in 1 year.

Of the women who were positive for HPV 16, HPV 18 or infection by multiple HPV types (14 out of 49), 9 (64.3%) agreed to proceed with further investigation (Table 3). Of the 49 who had positive HPV DNA tests, 27 (55%) required colposcopy assessment.

For the 14 women who underwent colposcopy, 1 had normal finding, 11 (78.6%) had low grade colposcopic

Table 1. Country of origin for foreign domestic workers who agreed to be screened as part of the 2019 Helping Our Helpers programme

Country of origin	n (%)
Philippines	174 (78.7)
Indonesia	30 (13.6)
India	4 (1.8)
Myanmar	4 (1.8)
Sri Lanka	2 (0.9)
Not indicated	7 (3.2)

Table 2. Distribution for HPV DNA test results for foreign domestic workers who participated in the 2019 Helping Our Helpers programme

	n (%)
Non-16/18 positive	35 (71.4)
16 positive	4 (8.2)
18 positive	4 (8.2)
Positive for multiple HPV types 16 + 18 16 + non-16/18 16 + 18 + non-16/18 positive	6 (12.2) 81 4 1
Total number of positive HPV tests	49 (22.2)

HPV: human papillomavirus

Table 3. Distribution of foreign domestic workers who had further investigation

	n (%)	Cytology only n (%)	Colposcopy only n (%)	Colposcopy following abnormal cytology n (%)
Further investigation	32 (65.3)	23 (46.9)	9 (18.4)	5 (10.2)
Non-16/18	23 (46.9)	22	1	4
16 positive	4 (8.2)	1	3	1
18 positive	1 (2.0)		1	
Multiple strains	4 (8.2)		4	
Declined further investigation	17 (34.7)			
Total no. of positive HPV tests	49 (22.2)			

findings while 2 (14.3%) had high grade findings (Table 4). Ten women underwent colposcopically guided cervical biopsy and 5 of these women had histologically proven high grade squamous intraepithelial lesions (HSIL) (Table 5). Of the 14 women in this cohort who screened positive for high-risk HPV, 5 (35.7%) had a biopsy proven HSIL.

DISCUSSION

The HOH pilot programme provides a rare glimpse of cervical intraepithelial neoplasia in women who work as FDWs in Singapore. Cervical cancer screening is not currently part of the pre-employment medical examination in Singapore. There is also little to no formal cervical cancer screening in the FDWs' countries of origin. It is therefore unlikely that these age-appropriate and eligible women would have ever received screening that is accepted as a WHO standard in global public health. The demographics of the women who participated in the programme are largely reflective of the FDW population in Singapore.

It is interesting to note that although 322 FDWs made appointments through the programme, there was a default rate of 30%. A further 2% declined screening after receiving more information about recommended follow-up for positive screening tests. Of those who

Table 4. Colposcopy findings

	n (%)	No further colposcopy n (%)	Colposcopy opinion[a] n (%)		
No. requiring colposcopy, n = 27					
Abnormal cytology	13 (26.5)	8 (16.3)		5 (10.2)	
HPV 16,18, multiple strains	14 (28.5)	5 (10.2)		9 (18.4)	
			Normal	Grade 1	Grade 2
			1 (2)	11 (22.4)	2 (4)

[a] Colposcopy opinion based on the 2011 International Federation for Cervical Pathology and Colposcopy (IFCPC) terminology

Table 5. Cytology and histology results

	n (%)	Normal n (%)	Grade 1 & 2 colposcopy findings n (%)		
			13 (26.5%)		
			HSIL	LSIL	ASCUS
Cytology results			2 (4)	3 (6.1)	8 (16.3)
Histology results	10 (20.4)	3 (6.1)	5 (10.2)	2 (4)	–

ASCUS: atypical squamous cells of undetermined significance; HSIL: high grade squamous intraepithelial lesion; LSIL: low grade squamous intraepithelial lesion

underwent screening, 51% who had positive screening tests declined cytology triage or colposcopy. This suggests a significant gap in knowledge and awareness of the importance of cervical cancer and its potentially devastating impact on personal health, daily function, and lifetime productivity in the FDW population in Singapore. Further study into the attitudes towards screening, cervical cancer prevention, and access to care would be instructive in helping develop effective programmes to improve the long-term health of FDWs. In a review of the responses given by women with positive screening results who declined follow-up, most of them expressed a desire to follow up with a private gynaecologist or when they returned to their country of origin. This pilot programme provided free HPV cervical cancer screening to eligible FDWs, although the cost of any follow-up appointments and treatments would have to be borne by the FDWs or their employers. These responses suggest that more needs to be done to support FDWs who have positive screening results and is an area worth further investigation.

In this pilot study, 36% of women who were positive for HPV 16 or 18 had histologically proven HSIL. This is similar to a study done in Singapore where 39.6% and 3.8% of women with high-grade lesions had HPV 16 and 18, respectively.[7] The data therefore suggest the epidemiological need for the national cervical cancer screening programme to be extended to the FDW population in Singapore.

Cervical cancer is almost entirely preventable through systematic HPV vaccination and cervical cancer screening.[8] The pathogenesis of cervical cancer is well-known and follows a predictable pattern of chronic infection by HPV strains known to cause cervical cancer. HPV 16 and 18 together are responsible for 70% of all cervical cancer. Preinvasive lesions of the cervix develop to form the source of dysplastic cells traditionally detected by cervical cytological investigations such as Pap smear. In the absence of treatment, a significant proportion of these preinvasive lesions then progress to invasive cancer.[9,10]

Cervical Screen Singapore, the national screening programme in Singapore, was launched in 2004 to provide a platform for the systematic population screening of local citizens and permanent residents. The screen positive rate using cytology alone has been reported to be between 2.1% and 5.4% in the highest uptake years of the programme.[11] In a more recent study done in a single institution, women were screened by co-testing and 8.9% were tested positive with atypical squamous cells of undetermined significance or more severe lesions using liquid-based cytology, while tests from HPV DNA showed 9.2% of total participants screening positive for high-risk HPV.[12] More

contemporary data from institutional audits suggest that programmes utilising HPV DNA testing have a screen positive rate of about 22%. Data from the current HOH study showed the screen positive rate to be 22.2%. This suggests a need to screen for cervical cancer and preinvasive cervical disease in Singapore FDWs. Further studies are warranted based on the findings of this pilot programme. Seow et al., in their cross-sectional evaluation of cervical cancer screening rates in a typical population of women in Singapore, found that a little over 50% of eligible women had cervical cancer screening. They concluded that more needed to be done to reach eligible disadvantaged women to help decrease the burden of disease nationally.[13]

HPV testing has become the standard of care in cervical cancer screening. It has evolved over the last 2 decades from becoming the reflex test of choice in triaging abnormal Pap smears,[14] to becoming the primary and only test required for cervical cancer screening. HPV testing provides a 5-year risk assessment of cervical precancer and cervical cancer, which can be valuable to the population of domestic workers in Singapore in terms of helping them understand their personal risk over a significant portion of their total employment in Singapore. This information is also useful to healthcare players and policymakers in understanding the risk and therefore potential burden of disease in this undertested and underserved population. Cervical cancer morbidity and healthcare costs can be avoided with close surveillance when the risk is high and managing early preinvasive lesions with simple treatments. These are simple things that improve the health of Singapore women, and to which Singapore's FDWs should have access.

REFERENCES

1. Bray F, Ferlay J, Soerjomataram I, et al. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. Ca Cancer J Clin 2018;68:394-424.
2. Health Promotion Board Singapore. Singapore Cancer Registry Annual Registry Report 2015, 19 Jun 2017. Available at: https://www.nrdo.gov.sg/docs/librariesprovider3/Publications-Cancer/cancer-registry-annual-report-2015_web.pdf?sfvrsn=1dd97be4_10. Accessed on 1 March 2020
3. World Health Organization, Population fact sheets. The Global Cancer Observatory, March 2019. Available at: https://gco.iarc.fr/today/fact-sheets-populations. Accessed on 1 March 2020.
4. World Health Organization. Comprehensive Cervical Cancer Control in the South-East Asia Region, 27-30 November 2012. Available at: https://apps.who.int/iris/bitstream/handle/10665/204876/B4992.pdf?sequence=1&isAllowed=y. Accessed on 3 July 2020.
5. Anwar SL, Tampubolon G, Hutajulu S, et al. Determinants of cancer screening awareness and participation among Indonesian women. BMC Cancer 2018;18:208.
6. The Society for Colposcopy and Cervical Pathology of Singapore. Management guidelines for cervical screening & preinvasive disease of the cervix, February 2019. Available at: https://www.sccps.org/wp-content/uploads/2019/03/CSS-Clinical-Mgt-Guidelines-2019_March-Release.pdf. Accessed on 14 March 2020.
7. Bruni L, Albero G, Serrano B, et al. ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre). Human papillomavirus and related diseases in Singapore. Summary Report, 17 June 2019. Available at: https://hpvcentre.net/statistics/reports/SGP.pdf. Accessed on 1 March 2020.
8. Velentzis LS, Smith MA, Simms KT, et al. Pathways to a cancer-free future: A protocol for modelled evaluations to maximize the future impact of interventions on cervical cancer in Australia. Gynecol Oncol 2019;152:465-71.
9. Khan MJ, Castle PE, Lorincz AT, et al. The elevated 10-year risk of cervical precancer and cancer in women with human papillomavirus (HPV) type 16 or 18 and the possible utility of type-specific HPV testing in clinical practice. J Natl Cancer Inst 2005;97:1072-9.
10. Silver MI, Andrews J, Cooper CK, et al. Risk of cervical Intraepithelial Neoplasia 2 or Worse by Cytology, Human Papillomavirus 16/18, and colposcopy impression: A systematic review and meta-analysis. Obstet Gynecol 2018;132:725-35.
11. Jin AZ, Louange EC, Chow KY, et al. Evaluation of the national cervical cancer screening programme in Singapore. Singapore Med J 2013;54:96-101.
12. Tay SK, Lin LE, Goh RC. Detection rate of high-grade cervical neoplasia and cost-effectiveness of high-risk human papillomavirus genotyping with reflex liquid-based cytology in cervical cancer screening. Ann Acad Med Singap 2017;46:267-73.
13. Seow A, Lee HP. Prevalence and determinants of cervical cancer screening: a community-based study in Singapore. Ann Acad Med Singap 1994;23:342-7.
14. Kirby TO, Huh WK, Partridge EE. Human papillomavirus triage of patients with atypical squamous cells of undetermined significance on cervical Papanicolaou smear. Ann Acad Med Singap 2003;32:590-6.