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Lower Incidence of Positive Gynecological Cancers in Examinees of a Unique Health Check-Up Institute, Ningen Dock in Japan, 2011-2016

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Abstract

The present study aims to determine the gynecologic health status of asymptomatic women at a unique Japanese Health Check-up Institute, Ningen Dock. Medical records of Japanese women, who underwent gynecological medical (health) examinations between January 2011 and December 2016, were retrospectively reviewed. Of the cervical smears from 8927 women aged 18 - 85 years, 50 (0.6%) were classified as dysplastic and malignant changes: 18 of low-grade squamous intraepithelial lesion, 10 high-grade squamous intraepithelial lesion, 21 atypical squamous cells of undetermined significance and 1 cervical squamous cell carcinoma. No case of cervical adenocarcinoma was found. Ultrasonographic examination detected uterus enlargements and ovary tumors in 2.0% and 0.9% of cases, respectively. Most of participants (95.6%) revealed no gynecologic abnormalities. The present study based on the records of Ningen Dock, where asymptomatic participants undergo a medical examination at their own expense, showed very low incidence of abnormal cytologic and/or ultrasonographic findings.

Keywords

Cervical Smear Screening, Transvaginal Sonography, Health Check-Up, Ningen Dock

1. Introduction

A community-based cervical screening strategy plays an important role to reduce cervical cancer incidence worldwide [1]. Cervical intraepithelial neoplasia typically develops into invasive cancer over a 10-year period and apparent cases

of rapidly progressive cervical cancer are likely to be among women who have escaped screening and proper follow-up [2]-[7]. The cervical screening, currently cytology, is a routine screening test used for the detection of early cervical abnormalities, namely precancerous dysplastic changes of the uterine cervix [2]-[7]. The screening is a relatively simple, low cost and noninvasive method. Together with transvaginal ultrasonography for detection of ovarian and uterine tumors, the routine screening reduces the probability of developing gynecological malignant diseases.

In many countries, undergoing cancer screening is not mandatory but voluntary. Some systemic review found a positive association of an awareness of the mortality rates associated gynecological cancer, educational level and financial status with gynecological malignant diseases attendance [8] [9] [10]. The level of knowledge and attitude toward screening are related to multiple factors such as ethnicity, place of residence, income, and social-economic status [11] [12] [13] [14] [15]. In Japan, there are unique facilities (namely Ningen Dock) of health check-up provide asymptomatic participants a medical examination including gynecological cancer screening activities at their own expense. Our previous exploratory study based on data from the 2002-2010 Ningen Dock suspected very low incidence of abnormal cytologic and/or ultrasonographic findings in this population [16]. To accomplish the hypothesis, we aim to determine the recent (2011-2016) medical records of Ningen Dock.

2. Methods

Between January 2011 and December 2016, 8927 asymptomatic women, age 18 - 85, visited the Ningen Dock in Matsunami General Hospital for their gynecological health check-up. The women underwent medical evaluations including a medical history, physical examination, blood sampling, urine sampling and radiological imaging as part of a routine health check-up and cancer screening. The cost was not covered by the social insurance.

All of these participants underwent gynecologic examinations including routine cancer screening (Papanicolaou test), transvaginal ultrasonography, and pelvic examination by a gynecologist. All participants provided written informed consents against these examination protocols, and the institutional ethics committee approved the procedure. Cervical and endometrial smears were taken using a speculum and brush and classified into 9 categories: normal, low-grade squamous intraepithelial lesions (LSIL), high-grade squamous intraepithelial lesions (HSIL), atypical squamous cells of undetermined significance (ASC-US), atypical squamous cells cannot exclude HSIL (ASC-H), squamous carcinoma, atypical glandular cells (AGC), adenocrcinoma in situ (AIS), adenocarcinoma and other malignant neoplasms. The endometrial cytological findings were divided into four categories: normal endometrium, benign endometrial abnormality, atypical endometrial cell, and suspected endometrial carcinoma. When classified as inadequate, the participants were soon resubmitted to smear examination. Their records of gynecologic findings were retrospectively reviewed. Data

and statistical analyses were done with Excel 2011 (Microsoft Corp., Redmond, WA, USA).

3. Results

Table 1 shows the cytologic and ultrasonografic findings of all subjects distributed by age class. Of the cervical smears, 50 (0.6%) were classified as abnormal. Low-grade cervical abnormalities were seen in 49 cases: 28 cases were classified as LSIL and HSIL, 21 were ASC-US. One malignant case was detected within this study period. No case of cervical adenocarcinoma was found. None of the categories were clustered in any specific age group.

The most frequently detected gynecologic finding was uterine enlargement, with a peak reaching approximately 17% - 19% for age groups 40 - 49 and 50 - 59 years. After 60 years, the frequency of uterine abnormalities decreased (Table 1). Ovarian tumor was detected in 4.3% to 9.3% of those aged 30 to 59 years, while those aged over 60 years showed less frequent. Table 1 summarized all other abnormal findings pointed out. No gynecologic abnormality was detected in 95.6% of cases. There was no special findings about the other medical history, physical examination, blood sampling, urine sampling (data not shown).

4. Discussion

The cervical and endometrial smears are widely used routine tests with many benefits, especially in detecting early cervical changes that can be treated to limit dysplastic processes developing into cancer. The previous literatures found squamous intraepithelial lesion SIL in 3% - 8% of women aged 20 - 29 years and

Table 1. Gynecologic findings of participants distributed by age group.

Age group, years	No. (%)	Cytology					Uterine tumor and abnormalities	Ovary tumor	Cervical Polypoid	Prolaps /Ptosis	Others*
		Cervix				EM**					
		LSIL	HSIL	ASC-US	SCC	Other than normal					
<19	8 (<0.1)	0	0	0	0	0	0	1 (0.2)	0	0	0
20 - 29	452 (5.1)	0	0	5 (1.3)	0	0	1 (0.2)	6 (1.5)	0	0	0
30 - 39	1353 (15.2)	6 (1.5)	4 (1.0)	2 (0.5)	0	0	17 (4.3)	22 (5.6)	8 (1.8)	0	2 (0.5)
40 - 49	3410 (38.2)	5 (1.3)	3 (0.8)	3 (0.8)	0	1 (0.2)	75 (18.9)	37 (9.3)	28 (7.1)	1 (0.2)	4 (1.0)
50 - 59	2637 (29.5)	6 (1.5)	3 (0.8)	9 (2.2)	1 (0.2)	3 (0.8)	70 (17.6)	16 (4.3)	24 (6.1)	2 (0.5)	4 (1.0)
60 - 69	916 (10.0)	1 (0.2)	0	2 (0.5)	0	0	10 (2.5)	2 (0.5)	4 (1)	1 (0.2)	0
70 - 79	135 (0.1)	0	0	0	0	0	4 (1.0)	0	2 (0.5)	0	1 (0.2)
>80	16 (0.2)	0	0	0	0	0	0	0	0	0	0
Total	8927 (100)	18 (0.2)	10 (0.1)	21 (0.2)	1 (<0.1)	4 (<0.1)	177 (2.0)	84 (0.9)	66 (0.7)	4 (<0.1)	11 (0.1)
		396 (4.4)									

*including vaginosis, leukoplakie, Bartholin cyst, posthysterectomy. LSIL, low-grade squamous intraepithelial lesion; HSIL, high-grade squamous intraepithelial lesion; ASC-US, atypical squamous cells of undetermined significance; SCC, cervical squamous cell carcinoma; AGC, atypical grandular cells; EM; endometrium. **optional examination.

1% - 5% of over 30-year age group. In this retrospective single-center study, we used an approach similar to that used in our previous study [16], that investigated medical records of Japanese women who underwent gynecological examinations between 2002 and 2010. The former study found that, of the cervical smear tests on 7585 subjects in our study, 98.2% were negative. The incidence of abnormal cytologic findings (dysplastic changes and cervical cancer) was extremely low compared with other studies performed in developed countries (3.4% to 9%) [2]-[7]. Our findings of 2011-2016 Ningen Dock records are similar to those former observations and most of participants (95.6%) revealed no gynecologic abnormalities.

Substantial data point to persistent human papillomavirus (HPV) infection as cervical cancer cause. The mean time between HPV infection and invasive cancer is about 15 years, and within 2 to 4 years of detection 15.5% to 25.5% of low-grade epithelial lesions become high-grade lesions [17] [18] [19]. The most frequently sexually transmitted disease (STD) worldwide is HPV infection [20] [21]. Societies where sexual activity starts at a young age and where multiple partners are common are at high risk of exposure to HPV than in conservative societies. For example, a study in Jordan, one of the most conservative and religious countries, found that of the smears from 1176 women aged 18 - 70 years, 9 cases (0.8%) were classified as ASC-US and 2 cases (0.2%) were LSIL. In Ningen Dock which medical records we analyzed, asymptomatic participants undergo a medical examination at their own expense. The cultural tradition and high concern on check-up of our subjects restrict the likelihood of multiple sexual partners. This may explain why very low incidence of dysplastic changes and cervical cancer were found in our study group of women.

Of pelvic mass, uterine myomas and/or adenomyosis are estimated to be present in 20% - 25% or reproductive-age women, indicating that they are one of the most common human neoplasma [22] [23] [24]. A myoma does not necessarily produce symptoms, and even very large ones may go undetected by the patient, particularly if she is obese. Symptoms from myomas depend on their location, size and state of presentation; symptoms are present in 35% - 50% of patients with myomas. Ovarian tumors, cystic or solid, are also frequently asymptomatic and undetected by themselves. The diagnosis of these tumors is not usually difficult using ultrasonography at physical check-up. We observed lower frequency of uterine enlargement and ovarian tumors in our subjects.

All participants with abnormal cytologic and/or ultrasonographic findings were referred to the medical facilities for further managements. Although no additional information regarding their detail examination outcomes, the present study based on symptom-free population suggested annual gynecologic screening and proper follow-up programs even against asymptomatic women may remarkably reduce the probability of (pre)malignant disease. Since the study sample was shown to be representative population of high-income and high-attitude toward screening, most of our observations may have important implications in terms of public health.

This study has some limitations. The main limitation is that we cannot examine the associations of life style and health factors with cancer screening attendances. Moreover, we did not extend to the association between gynecological cancer screening, socio-demographic characteristics and educational level, financial status, and being married. Lastly small sample sizes limited our ability to examine the relation ship between cervical smear results and contraceptive method use among various sub-populations.

The current American Cancer Society guidelines recommended that screening stops at age 65 for women with adequate negative prior screening and no history of cervical intraepithelial neoplasma 2 of higher [25]. However, screening continues to be common among women over 65 years of age, even among those with less than 5-year life expectancy due to poor health [26]. It seems plausible that as clinical practice continues to change around the screening pelvic examination, consequent changes in utilization of reproductive health services among adolescence to menopausal.

5. Conclusion

In conclusion, not paying attention to cancer screening is risk factors for non-attendance to health check-up. In this study, we confirmed that Ningen Dock attendances were associated with extremely lower in positive gynecology cancer screening incidence. These findings are of importance for improving the gynecological cancer screening practices of the lower screening attendance in Japan.

Conflict of Interest

The authors declare no conflict of interest.

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