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ORIGINAL ARTICLE

Organizational aspects of breast cancer screening in Sarajevo region

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Summary

Purpose: *To analyze basic parameters of success and organizational aspects of screening for breast cancer implemented in the Sarajevo Canton area during the period 2000-2006 and, based on the acquired experience, to suggest the most adequate model of screening in order to create a continuing and efficient constituent part of the population healthcare system.*

Patients and methods: *Out of 30,134 women of the target age group 45-55 years, an invitation was delivered to 27,473 of them. 16,085 (53.4%) women were screened. Out of this number 33.6% came after the invitation and the remaining 66.4% were informed of the screening project from other sources, most of them after their doctor's advice.*

Results: *In 355 (2.2%) examined women mammographic findings were suspicious for malignancy, and out of this number in 187 (1.16%) women cancer was histologically proven. All diagnosed cancers were potentially curable by surgery. Even though this screening project could be considered as successful after its termination, early detection of breast cancer is not carried out as regular activity due to non existing system to refer women for examination, insufficient technical equipment and shortage of qualified and trained medical personnel.*

Conclusion: *Based on the experience acquired, we believe that breast cancer screening, as an overall and continuing process, should be part of the regular healthcare system rather than a project or campaign. Screening needs to be an integral part of the primary healthcare system with family medicine as a starting point. Sufficient number of qualified and trained medical personnel, mammographers, spare parts, maintenance and service of the equipment are necessary. Good cooperation and communication of institutions included in the screening and flow of relevant information are of basic importance.*

Key words: breast cancer, organizational aspects, screening

Introduction

Breast cancer is the most common malignant tumor (32% of all malignancies) and the most common cause of death in women aged 45-55 years in Bosnia and Herzegovina [1]. Based on the predicted annual incidence of 79.2 in the Canton of Sarajevo, about 160-180 new breast cancer cases are expected each year [2]. Yet, according to obtained data this number is higher than 200. A constant increase in incidence is recorded from 67.2/100,000 women in 1998 to 91.69/100,000 women in 2005 [3]. More than 80% of women come in advanced stage of disease when the treatment requires complex therapeutic procedures with large financial cost and uncertain final outcome [1].

Regular and good screening significantly reduces mortality of breast cancer [4,5]. The first organized breast cancer screening started in New York in 1963 and led to reduction of mortality by 20-30%. A Swedish study from 1977 showed reduced mortality by 30% [4,5]. Besides reduction of mortality rate, success of screening for women aged 40-49 is also evaluated by the increased number of breast-preserving surgical procedures [6-11]. Therefore, the World Health Organization (WHO) recommends breast cancer screening in all environments where and when the circumstances allow to do so.

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Possible screening methods are physical examination (inspection and palpation of breasts and relevant lymph node regions), self-examination, ultrasound and mammography. As of today the only established and proved method of screening is mammography [7,8].

Screening should include women older than 50 years even though there is a dilemma if the screening should be started at the age of 40 [12,13]. It is important to emphasize that screening should be a continuing process since mammographic check ups are repeated regularly in 12 to 18-month periods with inclusion of new women who arrive to this age group [11].

The success rate of early breast cancer detection depends on several factors like good quality of radiological equipment, level of medical personnel education, good organization and coordination of all segments of the screening process and response of women to check ups. We consider screening to be successful if [6,7]: response is at least 70%; maximal radiation dose up to 2 mGy; repeated check ups to 3%; number of suspected cancers to 10% in first, up to 5% in repeated screening; number of diagnosed cancers amenable to surgical treatment at least 70%; results need to be available within 2 weeks.

Early detection of breast conditions in Bosnia and Herzegovina dates back to 1969 when the Center for detection and diagnosis of breast and genital organs tumors was formed as part of the Clinic of Gynecology and Obstetrics in Sarajevo. This Center functioned as interdisciplinary team (gynecologist, surgeon, radiologist, and pathologist). In the period 1969-1984 49,000 women from all areas of Bosnia and Herzegovina visited this Center and during this period were registered 1,176 (24%) benign tumors, 735 (15%) breast dysplasias, 474 (10%) secernating breasts and 434 (9%) breast cancers. During the first years of its activity (1971-1973) a screening was organized for 5,600 women in the town of Sarajevo with mammography and clinical examination. In the early 1990s the activities on breast cancer screening were discontinued due to the tragic war events.

In order to promote health and develop prevention programs, the Ministry of Health, Canton of Sarajevo, started in 2000 a screening project named "Early detection of breast diseases in women of Canton of Sarajevo".

The aim of this work was to analyze rates of acceptance and organizational aspects of the implemented screening in the area of Sarajevo Canton and to suggest the most adequate model for breast cancer screening based on the acquired experience in order to possibly become an overall continuing and efficient part of the healthcare system for the population.

Patients and methods

Project "Early detection of breast diseases in women of Sarajevo Canton"

The aim of the project was to enable women to have adequate and free of charge breast examination in an organized way and to establish a database for further observation and call for regular check up. This project included women aged 45-55 years. According to data from the Institute for Statistics of the Federation of Bosnia and Herzegovina in the area of the Sarajevo Canton, that includes 8 municipalities with different number of inhabitants, 30,134 women fell in that age group, programmed to be included in the project.

The project coordinator was the Ministry of Health of the Sarajevo Canton, and financial support was received by the Institute for Health Insurance of the same Canton. The project was carried out by the Institute for Women's Health and Motherhood Protection, Sarajevo; the Institute for Radiology, Clinical Center University of Sarajevo; the Institute for Oncology, Clinical Center, University of Sarajevo; the Institute for Pathology, School of Medicine, University of Sarajevo; and the Institute for Pathology, Clinical Center, University of Sarajevo.

Three stations were formed and equipped to implement screening and each of them covered at least two municipalities. At each point 15 women could be examined daily. Having that in mind, examining for the first time women aged 45-55 years according to the framework of screening would take at least 3 years.

Lists and addresses of women for this project were obtained from local communities and the Institute for Health Insurance of Sarajevo Canton. Each woman received an invitation letter with the terms of examination. For confirmation of the receipts a phone number of the institution and the project coordinator were included. The invitations were delivered to home address by courier. The examination was free of charge.

Each woman included in the project was examined as follows: clinical examination with inspection and palpation of breasts and lymphatic regions, and mammography of both breasts in craniocaudal and profile projection. Physical examination was performed by a gynecologist and mammography by radiologists and radiology technicians. The best part of the staff involved in the project was financed by the project budget, not by health insurance.

Results were recorded in specially-prepared forms for this project which, together with mammographies, were stored in the archive of the Institute for Women's Health and Motherhood Protection, Sarajevo.

Basic data for each woman coming for examination were stored in a special computer program.

Patients with normal findings on palpation and mammography were scheduled for repeat visit in one year. Patients with clinically and radiologically benign lesions (cysts, fibroadenoma) underwent additional ultrasound examination. In solitary cysts FNA was performed with evacuation of the content and cytological examination of the obtained material; the same procedure was done for women with secernating breast. Cytological findings were registered in a special form.

Patients with findings suspicious for malignancy were referred to a multidisciplinary team (surgeon, radiologist, pathologist and oncologist) for programming further diagnostic and therapeutic procedures. Data were collected for all patients who underwent surgery including site and type of surgery, size and type of lesion, number of surgically removed and positive lymph nodes (classified by TNM system), hormonal receptors and recommendation for further treatment filled in the patients' chart. All data were stored in electronic form and processed.

Results

The project was implemented in the period 1st October 2000 to 30th August 2006. An invitation was sent out to 27,473 (91.2%) women out of a total 30,134 in the target age group. The remaining 2661 women (8.8%) were not found at the address they were registered at the local community. A total of 5,401 (19.7%) women of the invited group responded to the invitation for screening. Besides this number, the screening joined 10,684 women aged 45-55 who came for examination without invitation, before or after the scheduled screening program. The total number of women screened was 16,085, i.e. 53.4% of the total number of women aged 45-55. Out of this number, 33.6% came after invitation and the remaining 66.4% came after advice of their doctor, mostly gynecologist, or after having been informed of the screening from the media or from other persons. The number of women for first examination included in the screening program and the percentage of inclusion and response listed by single municipalities is shown in Table 1.

Due to the prolonged duration of the screening program the next scheduled check was performed in 3,400 women aged 45-55.

Besides women aged 45-55 years, an additional 11,582 women of other age groups were examined, who were referred because of suspected pathological process or having a risk factor, like strong family history (9,702 first and 1,880 control mammography).

Of 16,085 women aged 45-55 years who were examined during the screening project in 355 (2.2%) the mammographic findings were suspicious for ma-

Table 1. Number of first examination for women included in the screening program and percentage of inclusion and response by single municipalities in the Canton of Sarajevo

Municipality	*Number of women aged 45-55 years*	*Number of first examination*	*Number of women with invitation*	*Number of women without invitation*	*Percentage of response*	*Percentage of inclusion*
Stari Grad 19 local communities	2,498	1,725	713	1,012	28.5	69.1
Novi Grad 26 local communities	7,746	5,935	1,590	4,345	20.5	76.6
Novo Sarajevo 17 local communities	2,890	2,221	464	1,757	16.1	76.9
Centar 26 local communities	5,643	3,036	824	2,212	14.6	53.8
Ilidža 16 local communities	3,834	1,801	753	1,048	19.6	47
Hadžići 3 local communities	1,472	788	478	310	32.5	53.5
Trnovo 3 local communities	120	22	22	0	18.3	18.3
Ilijaš 14 local communities	1,124	138	138	0	12.3	12.3
Vogošća 9 local communities	2,146	419	419	0	19.5	19.5
Total	27,473	16,085	5,401	10,684	19.7	58.5

lignancy and in 187 of them (1.16%) breast cancer was histologically proven. All diagnosed cancers were at a surgically treatable stage. The number of women with suspicious findings and proven cancer by municipality distribution in shown in Table 2.

Discussion

Breast cancer screening in the area of Sarajevo has a relatively long history and rich experience. Activities in that field were interrupted in the 1990s by the tragic war events, and building, equipment and complete documentation were destroyed.

In the post-war period the increasing problem of breast cancer is evident. Therefore, in 2000 the Ministry of Health started the project "Early detection of breast diseases in women of Sarajevo Canton" in order to carry out screening of the population most at risk and to create an environment for continuation of this process.

The project lasted longer than planned due to devastated buildings and equipment caused by accidental explosions of gas installations, intermittent failure of the available equipment but also to certain organizational and personnel flaws.

One can say that this project fulfilled some of its main aims and objectives and gave its positive contribution to the fight against breast cancer because:

a. A large number of women in the targeted age group was examined.
b. There was a significant number of patients in whom cancer was diagnosed through screening.
c. The diagnosed cancers were at an early stage and potentially curable. As a final result in Sarajevo Canton we saw larger numbers of women in whom cancer was diagnosed in early, potentially highly treatable phase than in other environments.
d. The awareness of the need for preventive breast examination was increased.

Analysis of implementation and the results of the screening project points out to some facts that can be of value for organizing such screening in other cities and countries.

A significant number of women were not staying at the address registered, while some of those examined were not in the list. This was caused by the known post-war migration of the population. Intensive and weakly controlled fluctuation of the population is also present in other countries in transition. This can lead to problems concerning complete organization of a healthcare system, and subsequently in preventive examinations.

There was low response to the delivered invitations for examination (between 12.3 and 32.5%, average 19.7%), and this was also observed in other similar organized screenings. Possible reasons are insufficient health education, neglecting of personal health, fear for diagnosis of a severe condition and bad media coverage of these actions. Identical factors were also present in other environments, especially in neighboring countries.

The largest number of examinations was observed in women who came after doctor's advice, especially gynecologist, whom they visited for regular gynecological control, or they had heard about screening from other women and they decided to go for examination.

The number of cases suspicious for cancer, which required repeat examination, was low, what fits into the criteria of a well-done screening. The number of diagnosed cancer was within the expected level and in accordance to the rates of other screening programs [5].

Even though this screening project was carried out and can be considered successful, one year after the project was completed early detection of breast cancer is not done as regular activity. Mammographic examinations are carried out sporadically and in a non-organized

Table 2. Number of suspicious findings and proven cancers in the municipalities of the Canton of Sarajevo in women aged 45-55 who underwent screening for breast cancer

Municipality	*Number of suspicious findings*	*Number of proven cancers*
Stari Grad	68	26
Novi Grad	82	70
Novo Sarajevo	37	27
Centar	128	34
Ilidža	22	20
Trnovo	0	0
Hadžići	3	3
Ilijaš	9	1
Vogošća	6	6
Total	355	187

manner. There is no systematic referral or invitation of women for mammography. Examination of asymptomatic individuals is left to the women themselves and are linked to numerous difficulties and limitation factors.

Even though large amount of money was invested in equipment, only one mammographer is functioning. One of the mammographers is completely amortized and the second one, even though is functioning properly, does not work due to shortage of staff (radiologists and radiology technicians). Therefore, people in need to carry out mammographic examination should wait for a couple of months. Necessary professional teams were not formed for further quality screening implementation. The best part of the personnel in this screening project worked on a part-time basis and stopped with the end of the project's financial support. There is only one radiologist and one radiology technician to diagnose breast diseases in primary healthcare, which is by no means sufficient.

According to our experience, if we want breast cancer screening as a continuing and successful process, it has to be regular part of the healthcare system rather than a project or campaign. It is clear that in our region we need investment in mammographers, additional personnel, spare parts (x-rays films, chemicals etc), maintenance and service of the equipment.

Conclusions

1. Screening should be an integral part of the primary healthcare system. It would be best if the starting point for screening were family medical centers, since they have an exact picture of the population they are responsible for. Besides, the best response we saw in the project was from women referred by their doctors. Family medical centers should be formed and create appropriate documentation that would be part of the women's charts and which should contain data about done and planned preventive examinations and their results.
2. It would be most efficient and convenient to implement screening of malignant tumors together with other preventive examinations, like to invite and refer women for breast and cervical cancer screening at the same time.
3. An adequate number of qualified and trained medical personnel is necessary. For an undisturbed course of a screening, trained and highly motivated radiologists and radiology technicians are needed. In order to achieve this there is need to plan, employ and educate radiologists and technicians for diagnosing breast diseases in primary healthcare.
4. Of utmost importance is good cooperation and communication with institutions which will establish the final diagnosis in cases of suspicious mammographic findings and implement therapy in cases of proven cancer. It is important to have two-ways flow of the relevant information. The results of the examination should be delivered both to the woman and the referring doctor.

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