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Professional paper

Fine Needle Aspiration Cytology of Minimal Breast Cancer in Istria County

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A B S T R A C T

Breast cancer is the most frequent malignant tumour and leading cause of death in women aged 35 to 64 years in Istria County. The minimal invasive carcinoma and in situ carcinoma have a better prognosis so we try to find them during preventive exams. The aim of this study was to identify minimal breast cancers in fine needle aspiration biopsies of breast lesions made in Pula General Hospital between the years 2006 and 2008. There were 39 tumours with a maximal diameter of less than 10 mm in 1316 biopsies and 251 cytologically diagnosed breast cancers. In most cases, they were solitary, well differentiated neoplasms (48.7%). They were diagnosed in women aged 39 to 89 years and most frequently found in women aged 60 to 69 years. The most frequent histological type of operated minimal breast carcinomas was invasive ductal carcinoma. In that period, the minimal breast cancer percentage of all cytologically diagnosed breast cancers was 15.5% but in the first 6 months of 2009, the result was 48.7%.

Key words: *breast, minimal breast cancer, fine needle aspiration cytology*

Introduction

Breast cancer is the most frequent malignant tumour and leading cause of death in women aged 35 to 64 years in Istria County[1]. Over the past few decades, substantial progress has been made in diagnosing and treatment of breast cancer. In 1999, the College of American Pathologists ranked the breast cancer prognostic factors in three categories[2]. The prognostic factors category I are: TNM grade, histological grade, mitotic count and hormone receptor status. They have a big influence for the survival rate. The TNM grade is the most important prognostic factor, especially the size of the tumour[2]. Tumours classified as T1a and T1b (maximal diameter 1 to 5 mm and 6 to 10 mm) and in situ carcinomas have better prognosis[2,3]. In Croatia, the National Breast Cancer Early Detection Program started in the second half of 2006. The screening method consists of mammography in 50 to 69-year old women, with a 2-year screening interval. One of the main goals of this program is the detection of a higher percentage of cancers at an early stage[4]. As a result of the use of screening mammography and the introduction of programs for early detection of breast cancers, many breast biopsies were performed for small, non-palpable abnormalities[5]. The minimally invasive and cost-effective diagnostic sampling procedures such as fine needle aspiration cytology (FNAC) and core needle biopsy have almost replaced open surgical biopsies. Fine needle aspiration cytology is a useful method of evaluation suspicious breast masses, and planning further treatment. FNAC reports of breast malignancy should provide not only the diagnosis of malignancy but also the type and grade of carcinoma[6]. The aim of this study was to investigate minimal breast cancers in fine needle aspiration biopsies of breast lesions made in Pula General Hospital between the years 2006 and 2008. The term minimal breast cancer includes all non-invasive cancers (Tis) and invasive cancers up to 10 mm in diameter (T1a,b)[7].

Patients and methods

Between 2006 and 2008, 1316 mainly ultrasound-guided fine needle aspiration biopsies of breast lesions were done at the Department of Cytology in Pula General Hospital. During that period, 251 breast cancers were cytologically diagnosed. In this study, we analyzed the minimal breast cancers with as maximal diameter of less than 10 mm on ultrasound exam as well as at the tis-

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sue sections after surgery, according to the age of the patients, the tumour size on ultrasound exam, the cytological differentiation grade and the histological type after the extirpation preoperatively marked lesion. The aspirate smears were air-dried and stained following the May-Grünwald-Giemsa method. The cytological grading of the smears was performed using the Robinson method. Tumours were classified histologically according to the World Health Organisation Histological Classification of Breast Tumours. Later, we compared the percentage of minimal breast cancer among all cytologically diagnosed breast cancers in that period, and in the first 6 months 2009.

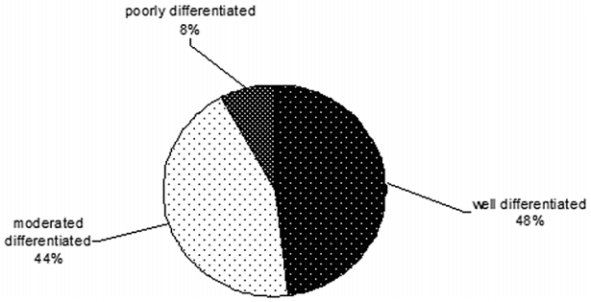

Fig. 2. Cytological differentiation grade distribution of the minimal breast cancers diagnosed in Pula General Hospital between years 2006 and 2008.

Results

In the three year period, out of the 251 cytologically diagnosed breast cancers, 39 (15.5%) were identified as a minimal breast cancer. The tumour sizes on ultrasound exam were from 4 to 9 mm. Cytologically diagnosed cancers were histologically confirmed in every woman operated in our hospital. At the time the tumours were found, the patients age was between 39 and 89 years; mostly 60 to 69 years (Figure 1). The minimal breast carcinoma cytological differentiation grade distribution was: 19 (48.7%) well differentiated, 17 (43.6%) moderately differentiated and 3 (7.7%) poorly differentiated carcinomas (Figure 2). Multiple tumours were found in only two patients with minimal breast carcinoma (5.4%), against multiple tumours were found in 32 (12.7%) women with breast carcinoma with a diameter larger than 10 mm. Following surgery, the histological types of tumours were: 24 invasive ductal carcinomas, 3 invasive lobular carcinomas, one in situ ductal carcinoma, one tubular carcinoma, one mixed invasive ductal and cribriforme carcinoma and one medullary carcinoma (Table 1). We did not have the surgery data of 8 patients. Three patients were not operated; two because of their age, one because she had another advanced malignant disease at the same time and five women were treated in other hospitals. Additionally, in the first six months of 2009, out of the 31 cytologically diagnosed breast cancers in Pula General Hospital, 15 (48.7%) were identified as minimal breast cancer.

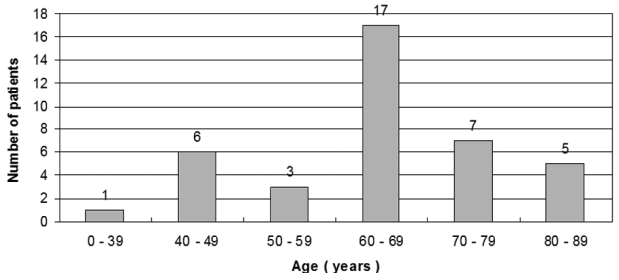

Fig. 1. Distribution of patients with minimal breast cancer cytologically diagnosed in Pula General Hospital between years 2006 and 2008 according to their age.

TABLE 1
HISTOLOGICAL TYPES OF OPERATED MINIMAL BREAST CANCERS BETWEEN STUDIED PATIENTS

Breast cancer histological type	Number of patients*
Invasive ductal carcinoma	24
Invasive lobular carcinoma	3
In situ ductal carcinoma	1
Tubular carcinoma	1
Medullary carcinoma	1
Mixed invasive ductal carcinoma and cribriforme carcinoma	1

* 8 patients without surgical data

Discussion and Conclusion

As a result of the use of screening mammography, many biopsies were performed for small, usually nonpalpable, mammographically detected abnormalities[8]. So, the breast biopsies of screened abnormalities contain a large number of minimal breast cancers[8]. The fine needle aspiration cytology (FNAC) has proved effective in producing a preoperative diagnosis of minimal breast cancer[9]. In our study, 15.5% of all the cytologically diagnosed breast cancers between 2006 and 2008 in Pula General Hospital, were minimal breast cancers. In the study made by Bezić et al. the proportion of minimal invasive cancers (T1a,b) and in situ cancers (Tis) were 15.16% and 2.78%, respectively[5]. Ductal carcinoma in situ constituted 16% of the breast cancers and 28.5% were invasive cancers 10 mm or less in diameter in the study presented by Cady et al.[10]. In those studies, the authors explored basic histopathologic characteristics of the breast cancer before the screening program started. A College of American Pathologists in Q-Probes study performed in 199 institutions showed favorable outcomes included percentage of tumours size ≤1 cm (57.8% *vs*. 36.5%) when tumours were detected by screening mammography (p< 001) compared to all other detection methods[11]. In the first 6 months of 2009, we noticed higher percent of minimal breast cancers cytologically diagnosed in Pula General Hospital (48.7%). Several factors tended to push the incidence upward. At that time, the second invitation

round for screening mammography was performed in Istria County resulting in a detection of the so called »interval breast cancers«. The other reasons could be better public awareness with a higher number performed mammographies and breast ultrasound exams, improvements in breast imaging, and the possibility to compare images with the ones made during the first invitation round. The most frequent age of patients with cytologically diagnosed minimal breast cancer in our study was similar to the distribution of new breast cancer cases in Croatia in 2007 made by Croatian National Cancer Registry[1]. In our study, the minimal breast cancers were mostly well differentiated (48.7%), which beside their size is another prognostic factor for better survival rate. Using the Robinson's cytological grading system, Robles-Frias et al., out of 100 cases of invasive ductal breast carcinoma, 36 classified as grade I[12]. Cytological grading can provide more informations on tumour biologic behaviour and correlate positively with histological grade[13]. As a histological grade I, Bezić et al. classified 33.65% in the whole group of breast tumours, and 60.15% in the group of minimal invasive cancers[5]. As in our study, among the invasive cancers, the most common histological types were ductal and lobular ones (69.7% and 11.4%, respectively)[5,8]. The multiple cancers were rarely found on first diagnosis of minimal breast cancer. The fine needle aspiration cytology is a useful diagnostic procedure for the evaluation of examination, mammography and ultrasonography and has a role in planning the therapeutic approach[14,15]. The reported sensitivity and specificity of FNAC of non palpable breast lesion approximate the results obtained from FNAC of palpable breast lesions[16]. The FNAC success of non palpable breast lesions depends on the experience of the individual who performs the aspiration, the nature of the abnormality, the accuracy of needle placement, and the number of samples obtained[16]. For the minimal breast cancer fine needle aspiration cytology is a reliable diagnostic method. Preventive exams and multidisciplinary team work are important in the earlier discovery of this malignant disease[5]. So, the concept of a multidisciplinary approach in breast cancer care is essential.

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CITODIJAGNOSTIKA MINIMALNIH KARCINOMA DOJKE U ISTARSKOJ ŽUPANIJI

SAŽETAK

Karcinom dojke je najčešći maligni tumor i vodeći uzrok smrti žena od 35 do 64 godine života u Istarskoj županiji. Minimalni invazivni karcinomi i karcinomi in situ imaju bolju prognozu te ih se nastoji otkriti preventivnim pregledima. Cilj rada je bio izdvojiti minimalne karcinome dojke iz punktata lezija dojke učinjenih u Općoj bolnici Pula u periodu od 2006 do 2008 godine. U našem materijalu od 1316 punktata i 251 citološki dijagnosticiranih karcinoma dojke bilo je 39 karcinoma najvećeg promjera manjeg od 10 mm. Većinom se radilo o solitarnim, dobro diferenciranim neoplazmama (48,7%). Dijagnosticirani su kod žena u dobi od 39 do 89 godina života, a najčešće su nađeni kod žena u dobi od 60 do 69 godina. Nakon operativnog zahvata, najčešći patohistološki tip karcinoma bio je invazivni duktalni karcinom. U tom periodu, od svih citološki dijagnosticiranih karcinoma dojke, bilo je 15,5% minimalnih karcinoma dojke, dok je u prvih 6 mjeseci 2009. godine taj postotak iznosio 48,7%.