

Evaluation of cytopathology in diagnosing breast cancer in Khartoum

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الخلاصة

الأهداف: تقويم فحص الرشف بالإبر في تشخيص سرطان الثدي في الخرطوم يهدف إلى دراسة شدة الحساسية وإختبار النوعية والدقة لفحص الخلايا المجهرية وإستخدامه في تشخيص أورام الثدي.
طريقة الدراسة: هذه دراسة وصفية توقعية أجريت في الفترة من يناير 2006 حتي فبراير 2008 م بمركز الخدمات الطبية والصحية- جامعة الخرطوم بالخرطوم- السودان. تم تحليل البيانات باستخدام جهاز الحاسوب عن طريق البرنامج الإحصائي لعلم الإجتتماع [SPSS].
النتائج: بلغ عدد التقارير الكلي 542، منها 271 فحص خلايا مجهرية و 271 فحص أنسجة. تراوحت أعمار المرضى بين 14 و 80 عاما (متوسط 41,0 + 15,3 عاما). كانت نتائج إختبارات شدة الحساسية والنوعية والدقة لفحص الخلايا المجهرية 56,1 و 80,9 و 63,8% علي التوالي. بينما كانت نفس الإختبارات لفحص الأنسجة 93,5 و 83,5 و 89,7% علي التوالي.
الخاتمة: - أظهر فحص الخلايا المجهرية أن إختبارات الحساسية والنوعية والدقة أقل مقارنة بفحص الأنسجة.

Abstract

Objectives: To study the accuracy of cytopathology in the diagnosis of breast cancer and to evaluate it as a diagnostic pathological tool in breast diseases.

Method: This was a descriptive prospective study which included all patients presenting with breast lumps or nipple discharge during the period between Jan 2006 & Feb 2008 to the Centre of Medical & Health Services of the University of Khartoum. Each patient was assessed clinically and by using cytopathology & histopathology. Data was analysed using the statistical package for social sciences (SPSS). Sensitivity, specificity and accuracy were calculated.

Results: The total number of patients was 271. The overall mean age was 41.0+ 15.3 (ranging from 14 to 80) years; each patient had cytopathology & histopathology reports. The overall sensitivity, specificity and accuracy of cytopathology were 56.1, 80.9 and 63.8% respectively while those of histopathology were 93.5, 83.5 and 89.7% respectively.

Conclusion: FNAC in Khartoum has low sensitivity, specificity & accuracy.

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Introduction

Breast cancer is the commonest female malignancy worldwide⁽¹⁾. The best outcome of management is achieved with early detection of small or impalpable lumps. Many diagnostic tools are used in cases of suspected breast cancer e.g. the triple assessment which includes clinical assessment, mammography or ultrasonography and fine needle aspiration (FNA) & this has reduced dramatically the use of open biopsy^(2,3,4). For effective management, a multidisciplinary approach is essential⁽⁵⁾.

FNA cytology (FNAC) is an established tool in diagnosing palpable breast lumps^(6,7) and in detecting axillary nodal invasion⁽⁸⁾. Alongside clinical and imaging assessment, FNAC is used in diagnosing symptomatic breast cancer. Although FNAC is cheap, rapid and accurate, studies show that histologic diagnosis is more sensitive and specific⁽⁹⁾. The latter diagnoses benign lesions, assesses the invasion and grade of cancer and shows the subtype as well⁽⁶⁾. FNAC improves patient selection for biopsy⁽¹⁰⁾. Studies show that FNAC is accurate and cost effective but sometimes should not be the isolated pathological diagnostic tool. It has some limitations⁽¹⁾.

Some prognostic factors like grading can be described

in FNAC as in core biopsy but tumour architecture is less described by FNAC while vascular invasion and tumour size cannot be accurately described by small samples⁽¹¹⁾. Cytology can be used intraoperatively for assessing breast tumours and sentinel lymph nodes; this is a rapid procedure which preserves the tissues for permanent section and provides clear details^(12,13). By 1992, as many as 62% of breast cancer patients were diagnosed by FNA or core needle biopsy only i.e. there was a great reduction in open biopsy rate⁽¹⁴⁾. Many are now replacing FNA with histological assessment⁽¹⁵⁾ by using core needle biopsy by using the trucut biopsy. It shows variable ranges of sensitivity, specificity and accuracy but in experienced hands it provides a suitable sized mass for histological assessment with negligible complications. In a study done in early 1980s in New York, tru-cut needle biopsy showed overall sensitivity of 89% in diagnosing breast cancer, and 94% in masses more than 2.5 cm, and specificity of 100%⁽¹⁶⁾. However, some workers reported better sensitivity and accuracy with FNA in comparison with Tru-Cut needle biopsy⁽¹⁷⁾.

In the Sudan, few main hospitals have pathology departments. In Khartoum there is one national health laboratory & there are many private laboratories. Most

of the histopathology and cytopathology are done in these laboratories.

Objective

To evaluate the cytopathology as a diagnostic tool of breast cancer and to study its sensitivity, specificity and accuracy in diagnosing breast pathology in comparison to clinical assessment and histopathology in Khartoum.

Patients & Methods

This is a descriptive prospective study of 271 patients presented with either breast lumps or nipple discharge to the Centre of Medical & Health Services of the University of Khartoum during the period between January 2006 and February 2008. A computer-based questionnaire was filled for each patient with data including personal information, site, clinical presentation, clinical diagnosis, type of biopsy and the detailed results, correlation between the clinical, pathological and final diagnosis were performed, by using “double” assessment using the clinical and pathological assessment.

The sensitivity, specificity & accuracy were calculated for FNAC using Hatada et al method⁽¹⁾. The data was analyzed using Statistical Package for Social Sciences (SPSS).

Results

The total number of patients was 271, all had cytopathology & histopathology reports. Males to females were 2:55. The overall mean age was 41.0+15.3 (ranging between 14- 80) years; females were younger than males with a mean age of 40.6+15.1 (ranging between 14- 80) years while males had a mean age of 50.6+16.7 (ranging between 22-73) years. One hundred & eighty four patients (67.9%) had clinically malignant masses, 28 (10.3%) had suspicious lesions with equivocal clinical findings and the remaining (n= 59) had clinically benign lesions; four percent of the latter were inflammatory lesions.

There were 271 cytopathology reports, only five of these were taken from nipple discharge and the rest were freehand (non-guided or assisted) samples. Histopathological reports were based on excisional biopsy (n=135), quadrantectomy (n=10) and mastectomy (n=123), while trucut needle biopsies were only three.

The overall sensitivity, specificity and accuracy of the results of cytopathological reports were 56.1, 80.9 and 63.8% respectively while those for histopathological reports were 93.5, 83.5 and 89.7% respectively.

In cytopathology, thirteen percent of the reports were deficient in either raising more differential diagnoses or being inconclusive. On the other hand, 12.9% of the proven malignant lesions were reported to have invasive ductal carcinoma.

Discussion

Most of the medical practitioners in the Sudan are trying to follow the triple assessment protocol in patients with suspected breast cancer. The cornerstones are the clinical and pathological assessment, while imaging, including mammography or breast ultrasound, is not performed as a routine procedure in peripheral or small hospitals. Hence the breast management protocol is mainly by “double” assessment. A metaanalysis comparing 25 studies on cytopathology showed a range of sensitivity of 78- 100% and a specificity of 76- 100%⁽⁷⁾ compared to the specificity of 80.9% reported in this study. FNAC had reduced the number of operations in benign breast lumps which can be left in situ when confirmed pathologically⁽³⁾. It also improved the selection of patients for biopsy and saved time in the clinical management of breast lesions⁽¹⁰⁾. Hence reasonable sensitivity, specificity and accuracy are needed for safe application of this important diagnostic tool.

In this study (table 1) the sensitivity, specificity and accuracy are statistically significantly less than those reported in most of the recent studies in different parts of the world^(1,8,11-13,15). However the specificity is comparable to that reported by some of these studies & is even more than in some other reports^(1,15).

Table (1): Comparison of sensitivity, specificity and accuracy of FNAC in diagnosis of breast pathology between this study & other studies

Reference	Year of Publication	Country/ City	Number of Patients	Sensitivity	Specificity	Accuracy
Donley H et al ⁽¹¹⁾	2000	UK	NHSBSP	74- 96%	100%	-
Motomura K et al ⁽¹³⁾	2000	Japan	111	96%	90.8%	92.1%
Homesh N Aet al ⁽¹¹⁾	2005	Yemen	296	66.7%	81.8%	75.7%
Ueno E et al ⁽¹⁵⁾	2005	Japan	58	92.7%	76.9%	88.9%
Hiregoudar Abijit D et al ⁽¹²⁾	2006	India	40	95.24%	100%	100% b 97.5% m
Alkuwari E & Auger M ⁽⁸⁾	2008	Canada	115	65%	100%	-
Current study	2008	Sudan	271	56.1%	80.9%	63.8%

NHSBSP: National Health Service Breast Screening Programme, b: benign, m: malignant,
*: intraoperative imprint cytology, **: ultrasound-guided

In this study, sensitivity, specificity and accuracy of cytopathology are significantly less than histopathology. Histopathology is known to have a better assessment of most of the prognostic factors which are not assessed by the FNAC e.g. the presence of invasion.

In the current situation in Khartoum, FNAC is not the best tool to be used in the diagnosis of breast lumps. As histopathology is more accurate, & in the absence of trucut needles, excisional biopsy is the most suitable available option.

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