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Cost of Family History Clinic in a District General Hospital

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Abstract: The aim of this study was to review the financial costs of the Family History Clinic (FHC) in a Distric General Hospital (DGH), which offered women at moderate to high risk of familial breast cancer risk assessment, regular clinical and radiological screening according to local guidelines and protocols. The clinical record of all the patients attending a FHC in a DGH were reviewed for patient characteristics, strength of family history, number and cost of clinical visits, radiological and cytological examinations. The 79 patients in the family history follow-up clinic 32 (41%) were high risk, 46 (58%) were moderate risk and in one patient (1%) the clinical records were incomplete. The mean Claus score lifetime risk of familial cancer was 26(9). At a mean follow up of 4 years and after an expenditure of £68,225, only one mammographically occult grade II, node positive (3/16) interval cancer was detected in a woman from the high-risk group; no cancer was detected at the prevalent or incidental screening round. The average (standard deviation) outpatient cost of the FHC per patient was £870 (480). The average cost of attendance at a family history clinic was approximately £218/ patient/year. Significant clinical and radiological resources used to run a FHC in a DGH failed to yield early detection of breast cancer in a cohort of moderate and high-risk patients. The provision of a service of FHC outside Clinical Trial settings is difficult to justify.

Key words: Breast neoplasms, mammography, risk assessment, family, female, genetic screening, genetics, human mutation

INTRODUCTION

The heightened public awareness that mutations in BRCA 1 and 2 tumour suppresser genes located on 17q12-21 and 13q12 may be responsible for 5-10% of all breast cancers, has led to an increase in the demand for Family History Clinics (FHC) [1, 2, 3]. Data on breast cancer mortality and screening for familial breast cancer is awaited, but early results of screening from large dedicated centres report sensitivity rates of approximately 70% and a Standardised Detection Ratio similar to that in the NHS Breast Screening Programme. These results suggest that young women at risk of familial breast cancer may benefit from regular breast screening by early detection of in-situ lesions[4-7].

FHC are being adopted by an increasing number of breast units with utilization of valuable resources. The majority of women referred to FHC in DGHs usually have a moderately increased risk of breast cancer with only a small percent at a sufficiently high risk to justify genetic mutation analyses[8, 9]. Most FHCs offer patients risk assessment, earlier and more regular clinical and radiological screening compared to the general population according to national guidelines and local protocols[10-14]. Such clinics have implications for financial and manpower resources. The aim of this study was to review the financial costs of one FHC in a DGH.

MATERIALS AND METHODS

The clinical record of all the patients attending a FHC in a DGH were reviewed for patient characteristics, strength of family history, number and cost of clinical visits, radiological and cytological examinations. Risk assessment was carried out by objective analyses of the number of affected relatives and Claus table[15]. A lifetime risk of one in three by the Claus table was regarded as high-risk. The costing for the clinical visits and investigations were supplied by the hospital Finance Department. All statistical analyses were performed by the Graphpad™ computer soft ware.

RESULTS

The patients' characteristics are summarised in Table 1. The 79 patients attending the family history follow-up clinic, 32 (41%) were high risk, 46 (58%) were moderate risk and in one patient (1%) the risk could not be calculated because of incomplete clinical records Fig. 1. The mean Claus score lifetime risk of familial cancer was

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Table 1: Patient characteristics

	Mean (SD)
Age years	41 (7)
Follow-up years	4 (3)
Number of out-patient visits	6 (4)
Claus	26 (9)
Number of relatives	2 (1)

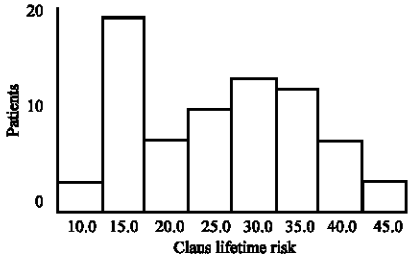

Fig. 1: A histogram to demonstrate the risk of familial breast cancer as calculated by the Claus table

Table 2: Cost of family history clinic

	Cost Mean (SD)
Cost of Out-patient visits	£490 (280)
Cost of radiology examination	£370 (220)
Cost of cytology examination	£11 (41)
Total cost of follow up	£870 (480)

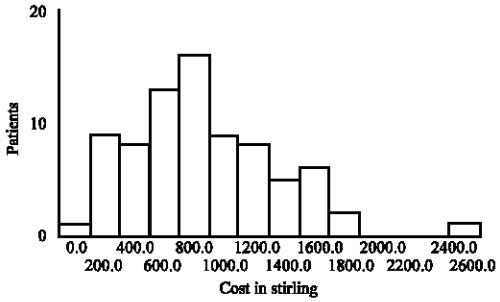

Fig. 2: A histogram to demonstrate the expenditure of the FHC

26(9), however in 4 patients the Claus risk could not be calculated. According to BASO guideline 3 of these patients were high-risk whilst for the remaining patient the data was incomplete. At a mean follow-up of 4 years no cancer was detected at the prevalent or incidental screening round. Only one woman from the high-risk group developed a mammographically occult grade II, node positive (3/16) interval cancer.

Surveillance mammography was abnormal in 8% of patients who underwent ultrasound scan. Overall, 6% of patients required fine needle aspiration cytology or ultrasound guided biopsy and 1% needed surgical biopsy to further investigate a mammographic and clinical abnormality (which was benign on final histology). The average (standard deviation) outpatient cost of the FHC per patient, including clinical examination, radiological assessment and fine needle aspiration cytology if required, was £870 (480) (Table 2, Fig. 2). For 25 patients this cost exceeded £1000.00. The average cost of attendance at a FHC was approximately £218 per patient per year. An expenditure of approximately £68, 225 on the FHC led to the diagnosis of only one interval breast cancer. However, the costing does not include inpatient cost of surgical biopsy, indirect costs of travelling, time off work and psychological stress etc.

DISCUSSION

The identification of women at high-risk of being genetic carriers is recognised as a potential for prevention, early detection and improved treatment of breast cancer, which may ultimately lead to reduction in mortality. The organisational framework of the FHC in the present study is representative of most FHCs in DGHs. The main costs were for clinical examination and radiological screening. The cost of fine needle aspiration cytology and ultrasound guided biopsy were minimal. These findings are in keeping with other studies of cost-effectiveness of diagnosing familial cancer[16].

The present study was not found to be as effective in detecting familial breast cancer as some previously reported research studies. In a study including seven centres participating in the EU Demonstration Programme on Clinical Services for Familial Breast Cancer, 75% of 161 tumours were detected in the course of planned examinations[17]. The study concluded that with regular expert clinical examination and mammography as well as teaching of "breast awareness", the majority of familial breast cancers could be detected by planned screening, even in women under the age of 50. In the present study, despite adhering to the policy of annual mammography, 6 monthly clinical examinations and regular breast self examination, only one interval cancer was diagnosed.

The reasons for this low cancer detection rate could be due to a number of limitations of study, which include small sample size and short follow-up. Another possibility is that mammography is not a sufficiently sensitive tool to detect breast cancer in younger patients with dense breasts. Perhaps, a longer follow-up will in due course reveal the occurrence of symptomatic cancers in these high-risk patients. This remains to be evaluated. Another explanation of the low cancer pick up rate in the present study could be a preponderance of patients with moderately increase risk, which were predominantly at the lower end of the risk spectrum (Fig. 1). This factor may have further diluted the cancer detection rate.

For an average DGH with a catchment population of 500,000 people, 32,000 of the population are females between 40-50 years of age (6.4%); If one assumes that

0.2% is BRCA positive, then only 64 women will fall within the true high risk group. The yield of screening these women could be much higher. Previous studies have demonstrated that 49% of women with BRAC1/2 germ-line mutation developed breast cancer over a mean follow-up period of 6 years,[18, 19].

Nevertheless, the FHC have a valuable role in reducing anxiety levels and improving correct risk perception[20-23]. Women with moderately increased risk of breast cancer could be offered a FHC appointment for a more accurate risk comprehension, to allay fears about breast cancer and to promote the development of a more realistic view of genetic testing[24]. Data such as that presented here would suggest that regular mammographic screening and follow-up should be limited to those women with a high probability of BRCA1/2 carrier status in order to make efficient use of limited resources.

In conclusion, significant clinical and radiological resources used to run this specific FHC failed to yield an increased early detection rate of breast cancer in a cohort of moderate and high-risk patients in a DGH setting. The significant expenditure and low cancer detection rate reported here suggest that meaningful reduction in mortality is unlikely to be achieved. The provision of such services outside Clinical Trial settings is therefore difficult to justify. In future studies the impact of preventative and surveillance strategies on breast cancer incidence and mortality need to be carefully monitored in order to achieve the goal of reduction in breast cancer mortality without undue medical, economic and psychological costs.

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