PublisherInfo		
PublisherName	:	BioMed Central
PublisherLocation	:	London
PublisherImprintName	:	BioMed Central

Chromosome 1 in breast cancer progression

ArticleInfo		
ArticleID	:	3700
ArticleDOI	:	10.1186/bcr-2000-66663
ArticleCitationID	:	66663
ArticleSequenceNumber	:	66
ArticleCategory	:	Paper Report
ArticleFirstPage	:	1
ArticleLastPage	:	3
ArticleHistory	:	RegistrationDate : 2000–3–21 OnlineDate : 2000–3–21
ArticleCopyright	:	Current Science Ltd2000
ArticleGrants	:	
ArticleContext	:	1305822

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Keywords

Chromosome 1, FISH, hyperplasia, progression

Introduction

Whilst ductal carcinoma *in situ* (DCIS) is now recognised as a precursor of invasive ductal carcinoma (IDC), it is still unclear whether hyperplastic lesions such as ductal epithelial hyperplasia and atypical ductal hyperplasia (ADH) are precursors of DCIS. Some of the changes found in cancer and DCIS have also been seen in hyperplasias, including amplification of chromosome 1.

Aims

To investigate if chromosome 1 aneusomy could play an early causal role in hyperplasias of the breast and if chromosome 1 abnormalities parallel breast cancer progression.

Comments

This paper lends support to the relevance of proposed precancerous breast lesions and highlights one of the genetic changes that may be involved in breast cancer at this early stage. This study is limited in that it only looks at a small number of hyperplastic cells in the presence of pre-existing cancer and at only one marker. Whilst more comprehensive analysis of such lesions might allow us to relate specific changes to the risk of developing breast cancer, such studies are technically demanding and suitable biological material is relatively rare.

Methods

Fluorescent *in situ* hybridisation was performed using a centromeric chromosome 1 probe (CEP1) on a series of seven carefully diagnosed hyperplasias that occurred concurrently with the carcinoma.

Results

Mean signal number for the chromosome 1 probe was significantly greater in all breast lesions compared to adjacent normal tissue and no case of monosomy was seen. Values for chromosome 1 copy number in DCIS and IDC were similar and greater than those for hyperplasia and ADH, which were also similar to each other.

Discussion

Whilst hyperplasias and ADH are considered markers for breast cancer risk, this study and other similar studies are starting to define the biological changes underlying these precancerous lesions. The role of chromosome 1 in benign proliferative disease of the breast is the subject of some debate in the literature, but in this study it would seem that the extent of chromosome 1 changes parallel histological progression.

References

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