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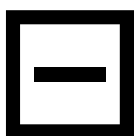
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AMPK expression patterns are significantly associated with poor prognosis in breast cancer patients

JaudahAl-Maghrabi^a✉, KaltoomAl-Sakkaf^b✉, Imtiaz AhmadQureshi^c✉, Nadeem ShafiqueButt^c✉,
LilaDamnhory^b, MohamedElshal^e, BasimAl-Maghrabi^f, AliaAldahlawi^g✉, SawsanAshoor^h, BarryBrownⁱ✉, PaulineDobsonⁱ✉,
Mohamad NidalKhabaz^c✉

- ^a Department of Pathology, Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia
^b Department of Medical Laboratory Technology, Faculty of Applied Medical Sciences, King Abdulaziz University, Jeddah, Saudi Arabia
^c Department of Pathology, Rabigh Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia
^d Department of Family and Community Medicine, Rabigh Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia
^e Department of Biological Sciences, Faculty of Sciences, King Abdulaziz University, Jeddah, Saudi Arabia
^f Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia
^g Immunology Unit, King Fahad Research Medical Centre, King Abdulaziz University, Jeddah, Saudi Arabia
^h Department of Radiology, KAU Hospital, Jeddah, Saudi Arabia
ⁱ Department of Human Metabolism, University of Sheffield, UK

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Highlights

- AMPK expression is downregulated in breast carcinoma in comparison with noncancerous tissues.
- Clinicopathological factors were significantly associated with AMPK immunohistochemical staining.

- No significant different survival distribution were observed with AMPK immunoreactivity.

Abstract

Many investigators have examined the functions of AMP-activated **protein kinase** (AMPK) in cancer biology and its **anti-neoplastic** features in cancer models. The goal of this research is to assess the association of the **immunohistochemical** expression of AMPK in human mammary **tumours** with the clinical data of **breast cancer** patients. 449 cases of previously diagnosed breast cancer, and 27 tissue samples of fibroadenomas and normal breast were utilized for detection of AMPK expression using **tissue microarrays** and immunohistochemistry. Brownish nuclear and **cytoplasmic** staining were present in **epithelial cells** and **stromal cells** in 333 (74.16%) and 348 (77.5%) cancer cases respectively indicating AMPK expression. Twenty two (81.48%) **control cases** showed AMPK immunoreexpression in both epithelial and stromal cells. Significant statistical association has been found between advanced stages of breast cancer and increased intensity of AMPK immunostaining only in epithelial cells (p-value = 0.0001). Histotypes have been correlated with AMPK immunostaining in epithelial cells only (p-value = 0.029). Low AMPK immunostaining scores were more dominant in DCIS, ductal and mixed type's ductal and mucinous histotypes, while high intense staining was more common in the **lobular** type. Furthermore, breast tumour cases with **lymph node metastases** showed significant AMPK expression in both epithelial and stromal cells (p-value = 0.0001 and p-value = 0.026). Low scores of AMPK immunostaining were common in breast cancer cases with positive **vascular invasion** (p-value = 0.007) and **disease recurrence** (p-value = 0.008). No significant differences in survival behavior distributions were observed for the different categories of AMPK immunostaining in epithelial and stromal cells.

In conclusion, our results showed decreased AMPK expression in breast cancer in comparison with the control group. AMPK expression was significantly correlated with some clinicopathological factors like advanced stage, lymph node involvement, vascular invasion and disease recurrence which give indications for poor clinical outcomes. Immunohistochemical staining of AMPK protein is a valuable method which could predict cases of breast cancer with poor prognosis.

Keywords

AMP-activated protein kinase AMPK Breast Cancer Immunohistochemistry