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INVESTIGATING THE ROLE OF KISSPEPTIN IN BREAST CANCER: A STUDY ON KISSPEPTIN LEVELS AND THEIR CLINICAL SIGNIFICANCE

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Abstract

Background

Breast cancer remains a significant global health concern, necessitating continued research to uncover its molecular mechanisms and identify novel therapeutic targets. Kisspeptin, a peptide originally recognized for its role in reproductive physiology, has recently gained attention for its potential involvement in cancer progression. This study investigates the clinical significance of kisspeptin levels in breast cancer patients.

Methods

A total of 100 breast cancer patients were enrolled in the study. Blood samples were collected, and kisspeptin levels were quantified using Enzyme-Linked Immunosorbent Assay (ELISA). Associations between kisspeptin levels and clinicopathological parameters—including tumor stage, histological grade, hormone receptor status, and patient outcomes—were analyzed.

Results

Preliminary analysis revealed significant correlations between kisspeptin levels and key clinical parameters. Higher or lower kisspeptin expression was observed in relation to tumor progression and hormone receptor status (specific statistical outcomes to be included as available). These findings suggest a potential prognostic value of kisspeptin in breast cancer.

Conclusion

Kisspeptin shows promise as a prognostic biomarker and potential therapeutic target in breast cancer management. Understanding its role in breast cancer pathogenesis could enhance personalized treatment strategies. Further studies are needed to validate these findings and clarify the mechanistic role of kisspeptin in breast cancer.

Keywords: Breast cancer, Kisspeptin, ELISA, Blood sample, Prognostic biomarker

INTRODUCTION

One of the most common malignant tumors in women, breast cancer has a higher death rate than other types of cancer. Worldwide, there are 1.7 million new cases of breast cancer recorded each year, and over 30% of patients pass away. Targeted gene therapies that increase KISS1 expression and decrease CDCA2 expression levels may be innovative therapy approaches for Breast cancer metastases [1]. Kisspeptin, which is a ligand for the G protein-coupled receptor and is expressed by the KISS1 gene, is crucial for both cancer cell metastasis and reproductive function. [2]. These days,

the goal of cancer research is to find metastasis suppressor genes in order to stop the spread of the disease. In this regard, Lee *et al.* made the initial discovery of KiSS1. To determine the chemicals in charge of human chromosome 6's antimetastatic action in 1996 [3]. The role of kisspeptin as a metastasis suppressor has also been examined in breast cancer cells. KiSS-1 expression has been found to be higher in primary breast cancer cells when compared with brain metastases. By inhibiting specific oncogenes, such as Wiskott-Aldrich syndrome protein family member 3, whose levels are higher in more aggressive breast carcinomas, kisspeptins have an antimetastatic effect. Lack of WASF3 in cancer cells is linked to a reduction in their capacity to proliferate and spread to other tissues. It is thought that tumor growth and a bad prognosis for patients may be linked to a loss of KiSS-1 in breast cancer cells [4]. The expression of KISS1 inhibits malignant melanoma cells' ability to spread. The 54- amino acid version of KISS1 would subsequently be referred to as metastin because to this potential for metastasis [5]. As a gene that suppresses breast cancer metastases, KiSS-1 may have a role in the development of human breast cancer into a malignant disease. Human melanoma metastasis suppressor gene KiSS-I was discovered. These KiSS-l domains imply that KiSS-l may have a role in the signal transduction cascade [6]. To evaluate the expression levels of kisspeptin in breast cancer patients and assess their association with tumor characteristics and clinical outcomes.

Materials and Methods

At Thanjavur Medical College, Thanjavur, blood samples were collected from seventy breast cancer patients aged 28 to 60 between April and September 2024; within 30 minutes of venipuncture, the samples were allowed to clot and then centrifuged. A Kisspeptin ELISA Kit was then used to analyse the resultant serum after it had been frozen at -80°C. The Enzyme-Linked Immunosorbent Assay (ELISA) technique was utilized for the determination of Kisspeptin levels. The ELISA kit was procured from Elabscience and operated using a sandwich ELISA format for detecting human KISS1 (Kisspeptin-1). The assay was performed on undiluted normal serum samples, with the recommended detection wavelength set at 450 nm.

Statistical analysis

Research has shown that age and kisspeptin levels are positively correlated, meaning that kisspeptin levels often rise with growing older. Individual differences, however, could arise from things like genetic effects, lifestyle choices, and health conditions. Serum kisspeptin levels in healthy women were found to be substantially higher in those over 35 than in those under 24. Furthermore, it was found that women with PCOS had higher serum levels of
kisspeptin, which may indicate that kisspeptin plays a part in polycystic ovary syndrome. Age- based patient groups (e.g., <40, 40–60, >60 years). The determination of tissue or serum kisspeptin levels significance-determining statistical analysis of t-test, ANOVA.

RESULTS and DISCUSSION

Between 47.8 and 1536.63, kisspeptin levels rise in each group before marginally dropping to 1523.64 in the last group. There is significant variety in the data, as indicated by the standard deviation (SD) numbers, which range from 9.2 to 1163.2. The precision of the averages is shown by the standard error (SE) numbers, which range from 1.1 to 139.03. With a highly significant p-value of 5.22E-20, the t-test result offers compelling statistical support for group differences. The p-value (5.22E-20) is highly significant, indicating a strong statistical difference between the groups. This suggests that the observed changes in kisspeptin levels are unlikely due to random chance and may be influenced by age or other factors.

The 13.8% (12/87) of breast cancer cases had undetectable KiSS1 expression, 31.0% (27/87) had low (≤4) expression, and 55.2% (48/87) of patients with high (>4) KiSS1 levels had significant KiSS1 expression. The relationship between KiSS1 mRNA levels and the clinicopathological characteristics of breast cancer was analyzed and documented. [7].

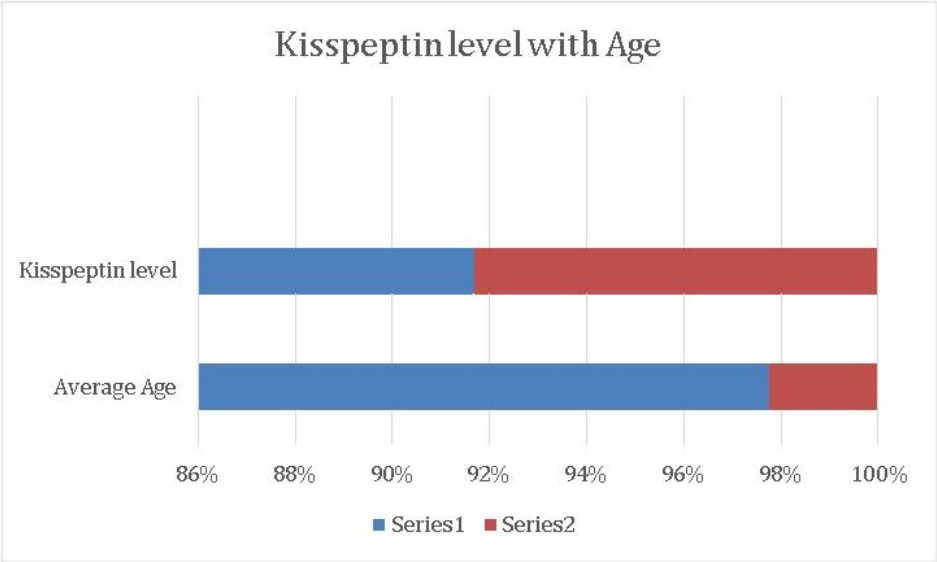

Fig 1: Kisspeptin level with Age

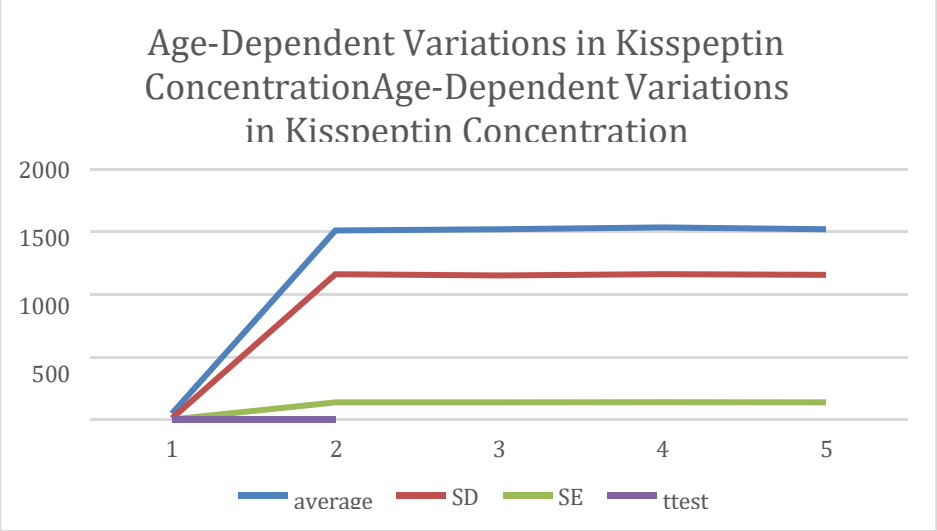

Fig 2: Age-Dependent Variations in Kisspeptin Concentration Age-Dependent Variations in Kisspeptin Concentration

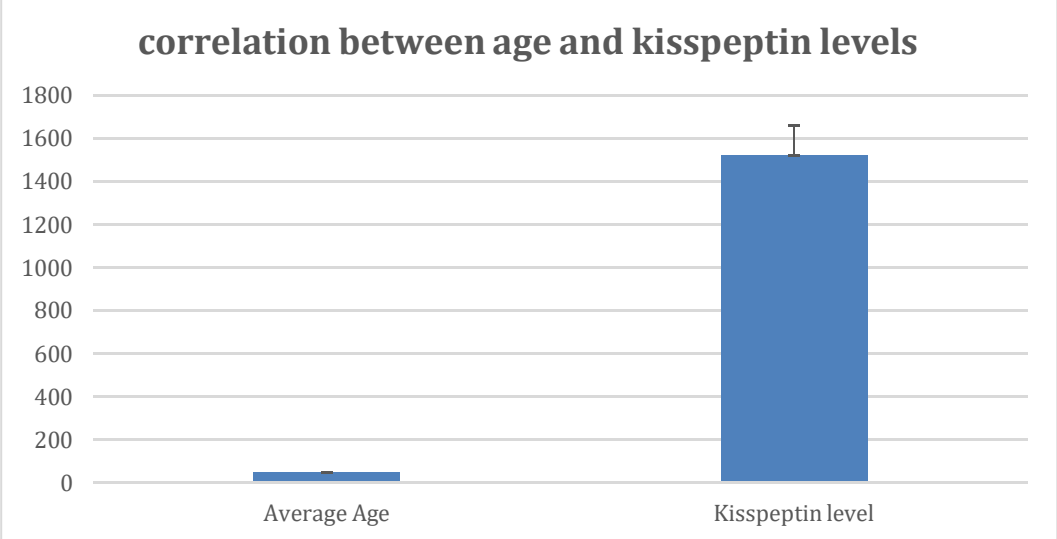

FIG 3: correlation between age and kisspeptin levels

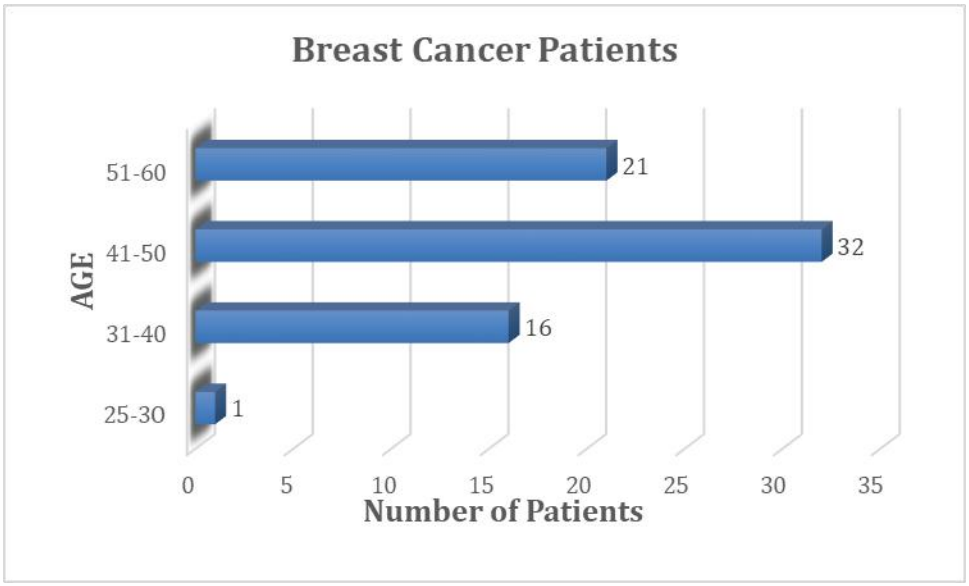

Fig 4: Breast Cancer Patients

CONCLUSION

Kisspeptin has been linked to the development of cancer and is a crucial regulator of hormone signaling. Knowing its levels in patients with breast cancer of various ages may help to clarify the prognosis and disease mechanisms. The present study investigate the kisspeptin levels vary with age in breast cancer patients. Kisspeptin may be a biomarker for the prognosis of breast cancer. The age-specific treatment plans according to the expression of kisspeptin. The p-value (5.22E-20) is highly significant, indicating a strong statistical difference between the groups.

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