

CHAPTER- 7

SUMMARY

Breast cancer persists as a pivotal global health interest, with its impact particularly pronounced in regions like India where structured screening programs are lacking, diagnostic tools are limited, and societal attitudes towards women's health contribute to delayed diagnoses. In light of these challenges, this study aims to assess the role of vitamin D receptor polymorphisms in breast cancer patients and their connection to steroid receptor status. Understanding the genetic factors influencing breast cancer susceptibility is pivotal for advancing diagnostic and treatment strategies, especially in contexts where late-stage diagnoses are prevalent.

The link amongst VDR gene polymorphisms and cancer of the breast has gained attention due to their potential implications for disease occurrence and prognosis. Steroid receptor status, encompassing estrogen, progesterone, and Her2/neu receptor status, depicts a decisive role in identifying the biological characteristics of breast cancer. Therefore, investigating the genetic alterations in the VDR gene and their association with these receptors can provide valuable insights into the underlying mechanisms of breast cancer development. The sample size, comprising 110 female patients with breast cancer, was chosen to provide statistical power for meaningful analyses. Patients were categorized based on various stages and grades as per histopathological findings, allowing for a comprehensive assessment of the disease's progression.

The study undertook a meticulous evaluation of Vitamin D levels in 110 female breast cancerous patients, categorizing them based on tumor grading and clinical staging. The study provides valuable insights into Vitamin D levels across

different stages, signifies a lower levels of vitamin D are linked to breast cancer progression.

The study delves into the genetic associations between VDR polymorphisms and breast cancerous susceptibility, specifically focusing on three key variants: FokI, BsmI, and ApaI. The study's conclusions reveal a notable association between VDR (FokI) polymorphism and breast cancer susceptibility. Both FF and Ff genotypes demonstrated a significant impact, indicating that variations in the FokI polymorphism are linked to the development of breast cancer. This underscores the prominence of this particular genetic variant in influencing susceptibility to the disease.

Contrastingly, the study found minimal impact for the VDR (BsmI) polymorphism, specifically with the bb genotype. This suggests that individuals carrying the bb genotype may have a reduced influence on breast cancer susceptibility compared to those with other genotypes of the BsmI polymorphism. The specific nature of this minimal impact requires further investigation to elucidate the underlying mechanisms. Surprisingly, the study did not observed any significant association between VDR (ApaI) polymorphisms and breast cancer. The genetic variations in ApaI, unlike those in FokI, do not seem to present a significant role in influencing susceptibility to breast cancer in the studied population. The study's genetic associations shed light on the varying impacts of different VDR polymorphisms, providing a foundation for future research aimed at deciphering the intricate genetic landscape of breast cancer susceptibility.

The vitamin D3 receptors play a role in modulating gene expression when complexed with 1,25-dihydroxycholecalciferol. Mammary glands normally express the VDR,

inhibiting estrogen-induced proliferation, maintaining differentiation, and may negatively regulate mammary epithelial growth. Thus, VDR polymorphisms can affect vitamin D metabolism and 25-OH)D levels, which have been linked to breast cancer prevention. Based on our observations, only the Fok1 FF and Apa1 AA VDR polymorphisms are positively correlated with ER-positive tumors but not ER-negative tumors while progesterone and Her2 receptors were not shown any correlation with apa1, fok1, and bsm1 vdr gene polymorphisms. This provides valuable insight into the complex landscape of cancer of the breast, with a focus on vitamin D receptor gene polymorphisms and their association with steroid receptor stature.

Thus, these reports suggest that additional markers beyond those routinely evaluated need to be identified to adopt suitable therapeutic strategies in order to improve outcomes.