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OPINION ARTICLE

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Development of Cutaneous Squamous Cell Carcinoma by the Regional Lymph Node Involvement

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Description

A protein unique to squamous cells called cornulin has recently been linked to a number of human disease processes. Cornulin is a protein extensively expressed in adult keratinocytes, particularly in the granular and lower cornified cell layers of the epidermis. Cornulin is encoded by the CRNN gene, which is located on chromosome 1q21 inside the epidermal differentiation complex fused-gene complex. As a result, it is regarded as a hallmark of late epidermal differentiation. Due to its involvement in the esophageal squamous epithelium's heat shock and stress responses, cornulin is also known as squamous epithelial heat shock protein 53 (SEP53). Moreover, the activity of SEP53 as a survival factor is connected to its reaction to stress.

Although cornulin is reported to be upregulated in acute stress reactions, it is noticeably downregulated in a number of squamous cell epithelium-related cancers. Research has shown that the expression of Cornulin is declining in Squamous Cell Carcinomas (SCCs) of the cervix, mouth, oesophagus, and skin. By analysing the relationship between Cornulin expression and the clinical stages as indicated by the Tumor Nodes and Metastases (TNM) staging of cutaneous SCC based on tumour size, regional lymph node involvement, and metastasis, we sought to characterise Cornulin as a molecular biomarker that could possibly help in monitoring disease progression and relapse, as well as predicting clinical outcomes for cSCC patients. According to our research, Cornulin may be used as a marker for the presence or absence of lymph nodes in instances of cutaneous squamous cell carcinoma.

Immunohistochemistry staining of tissue samples

De-identified tissue microarrays were used to collect the tissue samples for this trial, which contained 16 primary tumours from the head and neck, trunk, and extremities regions. Eight main cancers had lymph node metastasis (LNM) and eight primary tumours had no lymph node metastasis (N0) (N1). Each IHC experiment also included serial portions of a sample of normal skin tissue as an equalising control. The TNM classification and clinical stages of the tissue samples were hidden from the researchers during the immunohistochemical staining and analysis. Tissue microarray slide immunohistochemistry staining involved citric acid antigen extraction, followed by 5% Bovine Serum Albumin blocking (BSA).

The higher layers of the epidermis are rich in cornulin, a hallmark of late epidermal development. In cutaneous squamous cell carcinoma tissue samples, Cornulin expression has been shown to be diminished or completely eliminated in a prior research. Because to the strong negative impact of lymph node involvement on prognosis in patients with this form of skin cancer, we specifically looked at the link between Cornulin expression and nodal status as evaluated by the various TNM Clinicopathological markers in this study.

Relationship between cSCC lymph node involvement and cornulin expression

When compared to tissue samples without nodal metastases, N0, tissue samples with metastases to the lymph nodes, N1, indicate a substantial drop in Cornulin expression, according to Cornulin immunohistochemical detection and computer-assisted image analysis.

The most frequent malignant skin tumour in Black individuals and the second most prevalent in White people is cutaneous squamous cell carcinoma. It's significant to note that the incidence of cSCC has been rising recently as a result of a number of reasons, in-

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cluding lifetime exposure to UV light through tanning, occupational exposure, or the thinning of the ozone layer brought on by climate change. The search for new biomarker prognosticators that can supplement current histopathological approaches and improve the precision of diagnostic and prognostic tests for cutaneous squamous cell carcinoma is justified by the increasing prevalence of cSCC.

The TNM classification is being used extensively to evaluate the characteristics of tumour size (T), regional lymph node involvement (N), and distant metastases (M) in cSCC patients. The fact that individuals with identical TNM staging classification frequently experience diverse clinical outcomes emphasises the possibility that tumours with the same TNM clinical staging at the time of diagnosis may have varying propensity for proliferating, becoming aggressive, and spreading. Before metastasizing to distant tissue locations, cutaneous squamous cell carcinoma frequently spreads initially to local lymph nodes.

In original tumours that had lymph node metastases, cornulin was discovered to be considerably downregulated. This finding played a crucial role in the development of cSCC to the later clinical stages. Overall, because metastasis to local lymph nodes is a crucial element in determining the prognosis and recurrence of cutaneous squamous cell carcinoma, Cornulin expression has the potential to be a useful prognosticator for cSCC patients,