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COMPARATIVE ANALYSIS OF BASAL CELL SKIN CANCER: A STUDY IN SRI LANKA AND BELARUS

Introduction

Basal cell carcinoma (BCC) is the most common skin cancer globally, originating from the epidermal basal layer. Its primary cause is ultraviolet (UV) radiation, which damages DNA and activates the Sonic Hedgehog pathway, leading to tumor growth. While BCC rarely metastasizes, it is clinically significant due to its potential for local tissue destruction, especially in sensitive areas like the eyelids. The global incidence of BCC is rising, particularly in fair-skinned populations. However, this risk is not uniform. Epidemiological studies reveal significant variations across different ethnic and geographic groups. For example, while BCC is the dominant eyelid malignancy in Western countries, studies in Asia often report Sebaceous Carcinoma – a more aggressive tumor – as relatively more common. This paper aims to explore this variation by comparing eyelid BCC in two distinct populations: Sri Lanka, a tropical nation with high UV exposure and a predominantly darker-skinned population, and Belarus, a temperate nation with a predominantly fair-skinned population.

Thesis: This analysis posits that ethnic skin type (melanin protection) is a more powerful determinant of BCC prevalence than total ambient UV exposure alone. While UV radiation is the necessary trigger, the level of natural protection against it dictates the subsequent cancer risk.

Goal

To determine the percentage of BCC among malignant eyelid tumors in Sri Lanka.

To determine the percentage and epidemiological trends of BCC among malignant eyelid tumors in Belarus.

To compare the prevalence and identify the most common malignant eyelid tumor in each country.

To analyze the reasons for any observed differences, focusing on the roles of skin phototype, UV exposure patterns, and genetics.

To provide clinicians with guidance on differential diagnosis based on patient ethnicity.

Material and methods of research

This comparative analysis is based on data from two primary research studies:

Sri Lanka: A retrospective, single-center study from the National Eye Hospital, Colombo. It analyzed all eyelid lesions submitted for histopathology over four years (2013–2017). Data on malignant lesions were extracted, focusing on the proportion of BCC, Sebaceous Carcinoma, and Squamous Cell Carcinoma.

Belarus: A large-scale, population-based study using the Belarusian Cancer Registry over 25 years (1998–2022). It included 10,393 cases of malignant eyelid tumors (ICD code C44.1), tracking incidence trends and histological types.

Analysis: The percentage of BCC among malignant eyelid tumors in Sri Lanka was calculated and compared qualitatively with the predominant role of BCC in Belarus. The key comparison is the relative proportion of cancer types, acknowledging the limitations of comparing a single-center study with national registry data.

The results of the research and their discussion

The data showed very different patterns in the two countries.

Sri Lanka (2013–2017)

Total Malignant Tumors: 74 cases

Basal Cell Carcinoma (BCC): 18 cases.

Percentage of BCC: 24.3%

Most Common Cancer: Sebaceous Carcinoma.

Number of cases: 24.

Percentage: 32.4%.

Squamous Cell Carcinoma (SCC):

Number of cases: 14.

Percentage: 18.9%.

Other Rare Cancers: 18 cases (24.3%).

Main Finding: In this Sri Lankan study, BCC was NOT the most common eyelid cancer. Sebaceous Carcinoma was № 1.

Belarus (1998–2022).

Total Malignant Tumors: 10,393 cases.

Basal Cell Carcinoma (BCC): The study explicitly states that the main increase in eyelid cancers over the 25 years was “mainly... in basal cell forms.”

BCC is the predominant type.

Incidence Trend: Cases nearly doubled, from 293 in 1998 to 496 in 2022. This rise was driven by BCC.

Most Common Cancer: Basal Cell Carcinoma.

Main Finding: In Belarus, BCC is the dominant eyelid cancer, and its numbers are rising.

Table 1 – Study period

Study period	2013–2017	1998–2022
Total cases	74	10393
BCC Cases	18	Predominant
BCC Percentage	24.30%	Largest%
Most common cancer	Sebaceous carcinoma	Basal cell carcinoma

Conclusion

This comparative analysis demonstrates that the epidemiology of BCC is not global but local. The striking difference between Sri Lanka and Belarus highlights that medicine must be practiced with an understanding of ethnic and geographic context. The presence of protective melanin can fundamentally alter disease patterns, proving that skin type is a more powerful predictor of BCC prevalence than ambient UV exposure alone. This finding is crucial for accurate diagnosis and effective patient care worldwide.

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