

# Assessing potential risk factors for early-onset basal cell carcinomas

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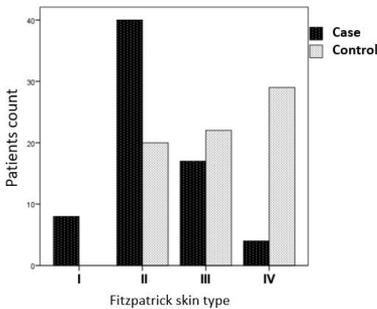
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**Introduction:** The incidence of basal cell carcinoma (BCC) is rising almost 10% each year worldwide, especially among young patients, predominantly women. **Objectives:** To study these recent trends, we investigate potential risk factors (RF) for sporadic early-onset BCCs with a case-control study.

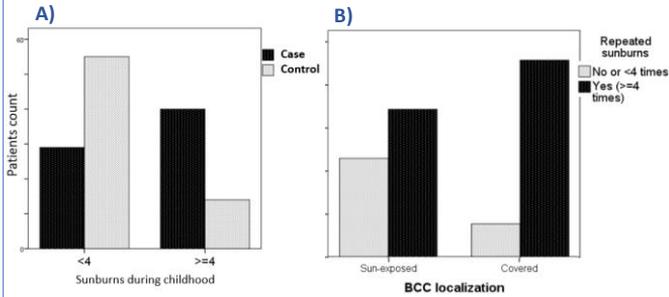
**Material and Methods:** BCC cases from patients  $\leq 45$  years diagnosed during the 2013-2017 period were selected. Age 45 was selected as the designation of young people because BCC cases  $\leq 45$ , in our population, were predominantly diagnosed in women, and from this age onwards were predominantly diagnosed in men, suggesting a different etiology in both groups. Controls, matched on age and gender, were selected from patients seeking medical advice in our dermatology department for other reasons not related to skin cancer (minor benign skin conditions as warts, cysts, benign and few melanocytic nevi, etc.). Both groups were interviewed about exposition to multiple RF. The anonymized databases were captured and analyzed with SPSS v20.0 (IBM Corporation, Armonk, NY, USA).

**Results and discussion:** 69 patients with BCC were enrolled and interviewed, as well as 69 controls, matched on age and gender. Of the 138 participants (69 cases-69 controls) 63.8% were female and 36.2% were male. Three RF for early-onset BCCs were identified to be independent RF with the multivariate analyzes: Fitzpatrick skin type (using type IV as reference) (Fig.1), family history of keratinocyte carcinoma (KC) ( $p=0.007$ ; OR 3.7; 95% CI=1.4-10.0) and  $\geq 4$  blistering sunburns during childhood (Fig.2).

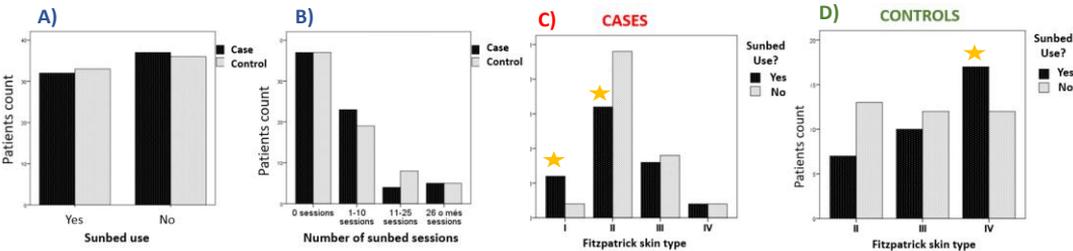
**Fig.1:** Fitzpatrick skin type ( $p=0.004$ ). We found a higher risk for BCC in type I (OR=24.4; 95% CI=2.2-270.7), type II (OR=9.2; 95% CI=2.6-32.9), and type III (OR 4.8; 95% CI=1.3-17.4), when compared with type IV.



**Fig.2: A)** We found the history of sunburns to be more often in young patients with BCCs than controls ( $p<0.001$ ). **B)** After, comparisons between BCCs in sun-exposed areas and those in covered areas were done. Repeated sunburns ( $\geq 4$  times) appeared in 60% of the BCCs in sun-exposed areas, while in up to 85.7% in BCCs from covered areas ( $p=0.029$ ). This suggests, that the etiology of BCCs in older age groups is largely attributable to cumulative UV exposure in sun-exposed areas while in younger age groups to intermittent UV exposure in covered areas as the trunk.



**Fig.3: A)** We found no differences between cases and controls regarding sunbeds use (yes/no) or **B)** the number of sessions. Despite this, is worth highlighting that among cases **C)** the ones who used indoor tanning were predominantly skin type I-II and among controls **D)** were majority type IV. This suggests, that among a population with a high frequency of sunbed use (overall use in women 50.1% and men 10.9%), the ones with fair skin are in a higher risk of developing an early-onset BCC. For the "age at the first tanning session" a little difference (not statistically significant) was found, 4/5 participants who used it before their twenties were cases.



**Conclusions:** We found multiple significant risk factors for early-onset BCCs but, contrastingly with earlier studies, indoor tanning was not within them. Because of the increasing incidence of BCC among young patients, we should be aware of the changing female predominance of these tumors and the significant risk factors for early-onset BCCs to address preventive campaigns.