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Risk of Melanoma Development from Giant Congenital Melanocytic Nevi (GCMN) and Psychological Adjustment and Quality of Life in Children and Adolescents with GCMN - An Analysis of Self- and Parent Reports

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Abstract: ***Giant congenital melanocytic nevi (GCMN) are one of the most frequent skin lesions encountered at birth. They are composed of collections of melanocytes (pigment-forming cells) that show distinct clinical and histopathological features. GCMN may be precursors of melanoma, and it has been suggested that the presence of atypical foci could increase the risk of malignant transformation. Congenital melanocytic nevi occur in approximately 1% of newborns and are usually classified according to their size. Giant congenital melanocytic nevi are most simply defined as melanocytic nevi that are greater than 20 cm in largest dimension; whereas small congenital nevi are defined as melanocytic nevi less that 1.5 cm in largest dimension.Giant congenital melanocytic nevi are associated with an increased risk of the development of melanoma. Giant congenital melanocytic naevus (GCMN) may be expected to affect psychosocial functioning of children and their parents due to deviant appearance and painful treatment.***

Keywords: Congenital melanocytic nevus;Malignant transformation; Negative pressure wound therapy.behavior problems; infancy; mental health; psychosocial functioning; quality of life.

1. Objectives

To evaluate the clinical characteristics and risk of melanoma development from GCMN and a study assessed health-related quality of life (HRQOL) and psychological adjustment in children and adolescents affected by giant congenital melanocytic nevi (GCMN) and identified potential predictors of adjustment.

2. Methods

Risk of Melanoma Development

In order to better define atypical GCMN, we analyzed DNA content and proliferative activity in 21 samples of GCMN, with (n=13) or without (n=8) cytologic atypia. Six benign acquired naevi (AN) and 6 malignant melanoma (MM) were used as controls. DNA content was determined with the CAS 200 image analyzer, and DNA histograms were classified according to the Auer classification. The proliferative indices (PI) were measured after Ki 67 immunostaining using the CAS 200 system. All AN and GCMN without atypia showed class I histograms (normal DNA content) and low PI (mean 1.9 and 2.1). Atypical GCMN showed in 10 cases an abnormal DNA content (class III or IV histograms) with low PI (mean 2.7), and in 3 cases a normal DNA content (class I histograms) with higher PI (mean 16.2). All MM displayed abnormal DNA content and high PI (mean 32.6).

Affect on Psychology

Participants were recruited worldwide with the help of patient organizations. Data were obtained from parents of 235 children affected by GCMN, aged between 1 month and 18 years (M = 6.3 y; SD = 5.0 y), using a web-based survey. Measures included the Pediatric Quality of Life Inventory TM 4.0 and the Strengths and Difficulties Questionnaire. Sample scores were compared to normative data. Demographic characteristics as well as GCMN-related variables were examined as possible predictors of outcome, using multivariate analyses.

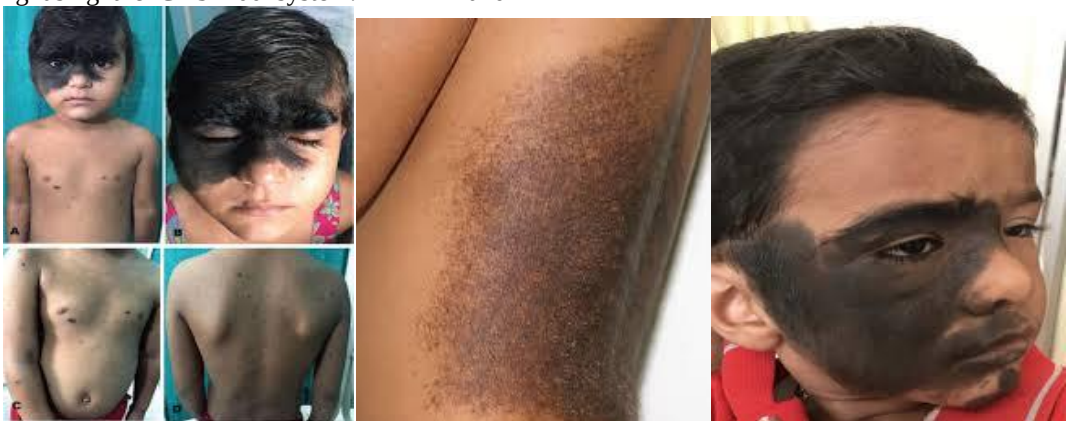
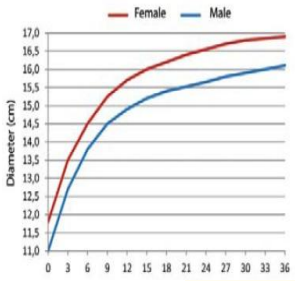
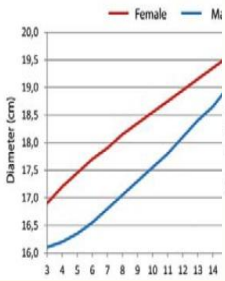
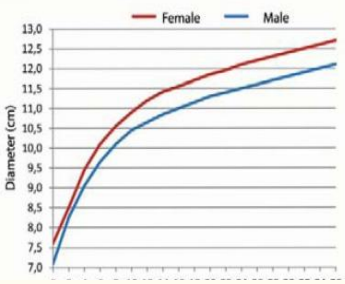


Figure 1, 2, 3 : Showing giant congenital melanocytic nevi







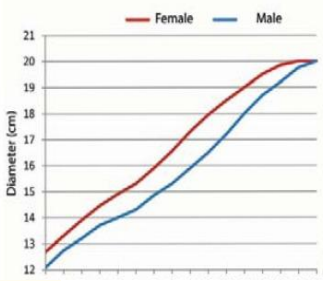


Figure 4 **Figure 5**

Figure 4: Size of giant congenital melanocytic nevus located on the head, according to the age
Figure 5: Size of giant congenital melanocytic nevus located on the body, according to the age

CHART 1

Studies evaluating the occurrence of melanoma associated to giant congenital melanocytic nevus

Authors	Country	Year of publication	Size of CMN included in the study	Number of MM/ total number of patients	% of patients with MM
Conway	United States ‡	1939	Only GCMN	4/40	10.0%
Greeley *et al.*	United States	1965	Giant and medium CMN	6/56	10.7%
Reed *et al.*	United States	1965	Mostly GCMN	17/55	30.9%
Lanier *et al.*	United States	1976	Giant and medium CMN	5/72	6.9%
Lorentzen *et al.*	Denmark	1977	Giant and medium CMN	3/151	2.0%
Arons & Hurwitz	United States	1983	Giant and medium CMN	0/46	0%
Quaba & Wallace	United Kingdom	1986	Giant and medium CMN	2/39	5.1%
Gari *et al.* *	United States	1988	Only GCMN	1/47	2.1%
Ruiz-Maldonado *et al.* *	Mexico	1992	Only GCMN	3/80	3.8%
Swerdlow *et al.*	United Kingdom	1995	Only GCMN	2/26	7.7%
Marghoob *et al.* *	United States	1996	Only GCMN	3/92	3.3%
Egan *et al.* *	United States	1998	Only GCMN	2/46	4.3%
Bittencourt *et al.* *	United States	2000	Only GCMN	3/160	1.9%
Bohn *et al.*	Sweden	2000	Giant and medium CMN	1/12	8.3%
Ka *et al.*	Several ‡	2005	Only GCMN	0/379	0%
Hale *et al.* *	United States	2005	Only GCMN	4/170	2.4%
Bett	Several ‡	2005	Giant and medium CMN	16/991	1.6%
Zaal *et al.*	Holland	2005	Giant and medium CMN	4/320	1.3%
Chan & Giam	Singapore	2006	Giant and medium CMN	0/39	0%
Kinsler *et al.* *	United Kingdom	2009	Only GCMN	4/122	3.3%
Total		1939-2009		73/2644	2.8%

3. Results

Risk of Melanoma Development

Study suggested that melanoma (cutaneous or extracutaneous) develops in approximately 5% of patients with a large (>20 cm) CMN, with about half of this risk in the first few years of life. Melanoma and neurocutaneous melanocytosis (NCM) are most likely in patients with CMN that have a final size of >40 cm in diameter, numerous satellite nevi, and a truncal location. One-third of individuals with NCM have multiple medium-sized (but no large) CMN.

Affect on Psychology

Parents of children and adolescents born with a GCMN reported significantly lower HRQOL and somewhat higher emotional and behavioral problems compared to community norms. Impairments in HRQOL and psychological adjustment were predicted by lower socioeconomic status, neurological problems, skin-related discomfort (e.g., itch or pain), and perceived stigmatization. The relationship between visibility of the skin lesion and psychological adjustment and psychosocial health was found to be mediated by perceived stigmatization. Social problems were reported for 30% of the patients and behavioural/emotional problems for 25.9%. There was no correlation between visibility of the naevus, treatment or child age and psychological problems. Mothers reported considerable psychosocial burden.

4. Conclusions

Risk of Melanoma Development

Abnormal DNA content seems to correlate with cytologic atypia in GCMN. Atypical GCMN exhibit an overall pattern of DNA content and cell proliferation intermediate between non-atypical naevi and MM.

Affect on Psychology

In children and adolescents affected by GCMN, those experiencing neurological problems, skin-related discomfort or high levels of perceived stigmatization are particularly vulnerable for impaired HRQOL and psychological maladjustment.It is concluded that children with GCMN are at increased risk of social and behavioural/emotional problems, and mothers suffer considerable psychological impact of their child's condition.Identification of stigma experiences and appropriate support may be crucial to enhancing psychological adjustment and quality of life in children with GCMN

5. Declaration of Conflicting Interest

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