Original Article

DOI: 10.7860/JCDR/2022/57904.16634

Dermatology Section

Clinical Pattern of Dermatological Conditions among Paediatric Patients Attending Outpatient Department in a Tertiary Care Centre of Rural Haryana, India

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ABSTRACT

Introduction: Skin disorders are common in paediatric age group and are associated with significant morbidity and stress. These differ from adults in clinical presentation, treatment and prognosis. Data on pattern of paediatric dermatoses can be used in planning healthcare programs.

Aim: To study the clinical pattern and prevalence of various skin conditions in paediatric age group in tertiary care centre of rural Haryana, India.

Materials and Methods: The present cross-sectional observational study was conducted in Bhagat Phool Singh Government Medical College (W) Khanpur Kalan, Sonepat, Haryana, India. A total of 1,003 consecutive Outpatient Department (OPD) patients upto age of 14 years presenting with skin conditions were included in study from a period May 2021 to January 2022. Various parameters like age, gender, pattern of distribution and type of skin lesions were assessed. Results were entered in excel sheet and frequency, percentages were calculated.

Results: The mean age of study population was 6.58 years. Out of 1,003 patients 56.53% were males and 43.47% were females. Maximum number (33.20%) of patients were in the age group of 1-5 years. Scabies (24.12%) was the most reported dermatological condition. Majority of dermatoses belonged to infections (32.40%) and infestations (24.83%) followed by eczemas (17.34%). Bacterial infections (15.25%) were most common infections followed by fungal (10.37%) and viral (6.78%) infections.

Conclusion: In the present study, infections and infestations were most common dermatological conditions. This study provides insight about the pattern of various dermatoses among children in rural setting.

Keywords: Infections, Paediatric dermatology, Scabies

INTRODUCTION

Skin diseases are common in all age groups in both developed and developing nations [1]. In comparison to adults children are more susceptible to acquire skin infections because of weak skin barrier, low immunity and poor hygiene. About 30% of patients visiting paediatric OPD are for dermatology related problems [2,3]. Pattern of skin disease in paediatric age group varies from region to region and is affected by ecological factors, socio-economic status, religion and level of literacy [4]. The estimated prevalence of paediatric dermatoses in different parts of India has been reported to be 8.7-35% in school based surveys [5]. The various studies undertaken in India have shown that the pattern of skin diseases is affected by age group, rural or urban setting and geographical areas [6,7].

Skin disease in children may be associated with their genetic makeup, socio-economic background, nutritional and immune status. These can be acute or chronic. Though they are rarely lethal; they are associated with significant morbidity and add to psychological stress to the patient and family [8]. Most of these conditions are manageable with proper hygiene and treatment [9]. There is lack of epidemiological data on paediatric dermatological problems in this region. Thus, the present study was carried out to observe the clinical pattern of paediatric dermatoses in rural Haryana, India. This study will enhance the knowledge of pattern of various skin conditions affecting children of these areas and will provide baseline data for future surveys.

MATERIALS AND METHODS

The present cross-sectional observational study was carried out at Department of Dermatology, Venereology and Leprosy, Bhagat Phool Singh Government Medical College (W) Khanpur Kalan, Sonepat, Haryana, India, after due permission from Institutional Ethical Committee (IEC) of our institute (BPSGMCW/RC/676/IEC/2021). The study was conducted over a period of nine months from May 2021 to January 2022. Children below the age of 14 years of either sex presenting with skin problems in skin OPD and those referred from paediatric OPD were enrolled in the study.

Inclusion criteria: Patients of age upto 14 years of either sex who provided detailed history, conducted necessary investigations if required and gave consent for participation were included in the study.

Exclusion criteria: Patients who did not give consent and patients whose primary lesions were altered by the application of topical medication were excluded from the study.

Sample size calculation: Taking expected proportion 0.3 and relative precision at 3% and 95% confidence interval the required sample size came out to be 896 [10].

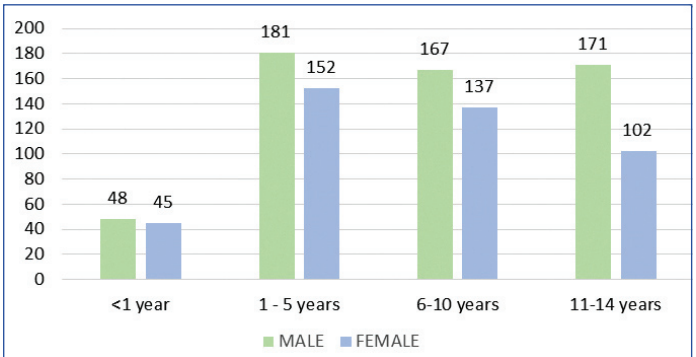
A total of 1,003 patients were recruited. Informed consent/assent was taken from the parent/guardian of each patient enrolled in the study after explaining in local language. Data was collected from patients/informant and entered in a proforma. The presenting complaint was registered as the main diagnosis. Patients already enrolled, who presented in OPD for some other skin condition later on were excluded to prevent duplicate entries. Diagnosis was based on detail review of history including family history, clinical features, general and cutaneous examination. Wherever necessary relevant investigations such as Potassium Hydroxide (KOH) mount, gram's stain, skin biopsy were carried out to help in diagnosis.

STATISTICAL ANALYSIS

The details of patients were entered in Microsoft excel 7 and frequency, percentages and mean of variables were calculated.

RESULTS

A total of 1,003 patients were recruited in the study. About 56.53% (567) were males and 43.47% (436) were females. Males to female ratio was 1.3:1. The mean age of study population was 6.58 years. Maximum number (33.20%, n=333) of patients were in the age group of 1-5 years followed by age group of 6-10 years (30.30%, n=304) and 11-14 years (27.22%, n=273), respectively [Table/Fig-1].



[Table/Fig-1]: Age and sex distribution of paediatrc dermatoses, N=1003.

Most of the cases were diagnosed clinically however relevant investigations were required in few cases. The KOH mount was done in 17 cases, viral markers in seven cases, skin biopsy in five cases, VDRL in three, bacterial culture in three cases, slit skin smear in one case and ultrasonography and Magnetic Resonance Imaging (MRI) abdomen to exclude disseminated visceral haemangiomatosis in a case of multiple haemangioma.

Most common presenting complaint was itching in 46.75% (n=469) cases. Scabies (24.12%, n=242) was the most reported dermatological condition. The most common group of dermatoses in this study was infection (32.40%, n=325), followed by infestations (24.83%, n=249). Infections and infestations together (57.23%, n=574) formed the largest group. This was followed by eczemas (17.34%, n=174) and hypersensitivity disorders (8.28%, n=83). Disorders of sweat and sebaceous gland constituted 5.28% (n=53) of all cases. Pigmentary disorders and papulosquamous disorders were 2.49% (n=25) and 2.09% (n=21), respectively. Distribution of various group of dermatoses is shown in [Table/Fig-2].

Distribution of dermatoses	Number	Percentage
Infections	325	32.40
Infestations	249	24.83
Papulosquamous disorders	21	2.09
Disorders of keratinisation	2	0.20
Pigmentary disorders	25	2.49
Eczemas	174	17.34
Photodermatitis	4	0.40
Hypersensitivity disorders	83	8.28
Disorders of sweat and sebaceous gland	53	5.28
Hair disorders	18	1.80
Nutritional	4	0.40
Nevoid and vascular disorders	12	1.20
Vesiculobullous disorders	1	0.10
Connective tissue disorders	1	0.10
Miscellaneous	31	3.09

[Table/Fig-2]: Distribution of dermatoses (N=1,003).

Bacterial infections (15.25%, n=153) were most common infection followed by fungal (10.37%, N=104) and viral (6.78%, n=68). Impetigo (7.27%, n=73) was commonest bacterial infection. Single case of Hansen's disease was noted [Table/Fig-3]. Dermatophyte infections (6.08%, n=61) were the most common fungal infections. Molluscum contagiosum (2.59%, n=26) was most prevalent viral infections. Scabies (24.12%, n=242) was the most common infestation. Pediculosis capitis was noted in seven patients (0.7%) and all were females. Distribution of various infections across various age groups is shown in [Table/Fig-4].

[Table/Fig-3]: Hansen's disease with deformity and trophic ulcer.

Infection \ Age (years)	<1	1- 5	6-10	11-14	Total	%
Bacterial	n=153					15.25
Impetigo	10	40	9	14	73	7.27
Pyoderma	0	13	35	9	57	5.68
Folliculitis	0	10	7	3	20	1.99
Paronychia	0	0	2	0	2	0.20
Hansen's disease	0	0	1	0	1	0.10
Fungal	n=104					10.37
Dermatophyte infections	1	13	20	27	61	6.08
Pityriasis versicolor	1	3	8	20	32	3.19
Candidiasis	4	6	0	0	10	0.99
Onychomycosis	0	0	0	1	1	0.10
Viral	n=68					6.78
Molluscum contagiosum	1	9	11	5	26	2.59
Warts	0	1	9	3	13	1.30
Hand foot mouth disease	0	2	1	0	3	0.30
Viral exanthem	2	9	1	0	12	1.20
Varicella	1	5	4	1	11	1.10
Herpes zoster	0	0	1	2	3	0.30
Infestations	n=249					24.82
Scabies	34	81	73	54	242	24.12
Pediculosis Capitis	0	0	4	3	7	0.70

[Table/Fig-4]: Distribution of infections and infestations in different age groups.

Eczemas constituted 17.34% (n=174) of all patients. Atopic dermatitis (4.08%, n=41) was the most common eczema; maximum cases were observed in age group 1-5 years. Seborrhoeic dermatitis constituted 3.59% cases [Table/Fig-5]. In hypersensitivity (8.28%, n=83) reactions, urticaria was the most common hypersensitivity reaction (5.18%, n=52). Majority of urticaria were observed in 11-14 age group while papular urticaria was common in 1-5 years age group. Distribution of various eczemas and hypersensitivity reactions with age wise distribution is shown in [Table/Fig-6].

Disorders of sweat and sebaceous gland constituted 5.28% (N=53). Acne (n=33) and miliaria (n=20) constituted 3.29% and 1.99% respectively. Pigmentary disorders formed 2.49% (n=25) of total patients. Viltiligo was seen in 2.09% patients (n=21) followed by freckles (n=3) and one case of Mongolian spot. Papulosquamous disorders were seen in 2.09% (n=21) of all cases. Six cases each of psoriasis [Table/Fig-7], lichen planus and pityriasis rosea were noted. Hair disorders constituted 1.80% (n=18) and alopecia areata

[Table/Fig-5]: Seborrhoeic dermatitis in an infant.

Dermatoses \ Age (years)	<1	1-5	6-10	11-14	Total	%
Eczemas	n=174					17.34
Atopic dermatitis	11	21	7	2	41	4.08
Seborrhoeic dermatitis	4	22	4	6	36	3.59
Infected eczema	0	1	2	2	5	0.50
Allergic contact dermatitis	0	4	10	5	19	1.89
Irritant contact dermatitis	0	0	2	2	4	0.40
Napkin dermatitis	1	4	0	0	5	0.50
Pompholyx	0	0	1	2	3	0.30
Pityriasis alba	0	3	6	2	11	1.09
Intertrigo	3	9	2	1	15	1.49
Other eczema	2	11	12	10	35	3.49
Hypersensitivity reactions	n=83					8.28
Urticaria	0	16	16	20	52	5.18
Papular urticaria	3	12	4	0	19	1.89
Pedrous dermatitis	0	1	2	1	4	0.40
Insect bite hypersensitivity	0	1	0	0	1	0.10
Pruritus	0	0	2	2	4	0.40
Henoch scholein purpura	0	0	1	1	2	0.20
Erythema multiforme	0	0	0	1	1	0.10

[Table/Fig-6]: Distribution of eczemas and hypersensitivity reactions.

(1.60%, n=16) was the most common hair problem. Distribution of dermatoses related to glands, pigmentary, papulosquamous and hair disorders is shown in [Table/Fig-8].

[Table/Fig-7]: Psoriasis.

Dermatoses \ Age (years)	<1	1-5	6-10	11-14	Total	%
Sweat & Seb. gland disorder	n=53					5.28
Acne	0	0	2	31	33	3.29
Miliaria	3	10	5	2	20	1.99
Pigmentary	n=25					2.49
Vitiligo	0	2	11	8	21	2.09
Freckles	0	0	1	2	3	0.30
Mongolian spot	0	1	0	0	1	0.10
Papulosquamous	n=21					2.09
Psoriasis	0	0	2	4	6	0.60
Lichen planus	0	1	1	4	6	0.60
Pityriasis rosea	0	0	2	4	6	0.60
Lichen nitidus	0	2	0	0	2	0.20
Pityriasis amiantacea	0	0	0	1	1	0.10
Hair disorders	n=18					1.80
Alopecia areata	0	7	8	1	16	1.60
Hairfall	0	0	2	0	2	0.20

[Table/Fig-8]: Distribution of glandular, papulosquamous, pigmentary, hair disorders.

Nevoid and vascular disorders constituted 1.20% (n=12) which included six cases of haemangiomas, two cases each of melanocytic and halo nevus and one case each of salmon patch and beckers nevus. Disorders of keratinization included two cases of ichthyosis [Table/Fig-9].

Among nutritional disorders (0.4%, n=4) there was one case of phrynoderma, one case of cheilitis and two cases of apthous ulcer. Photodermatoses (0.4%, n=4) included four cases of Polymorphic Light Eruption (PMLE). In vesiculobullous disorders, a single case of epidermolysis bullosa was seen in a newborn [Table/Fig-10].

[Table/Fig-9]: Ichthyosis. **[Table/Fig-10]:** Epidermolysis bullosa in a neonate. (Images from left to right).

In connective tissue disorders one case (0.1%) of linear scleroderma was recorded [Table/Fig-11]. Miscellaneous group included eight cases of milia, four cases of fissured sole, three cases of Erythema Toxicum Neonatorum (ETN), three cases of burn and three cases of dry skin. One case each of keratolysis exfoliativa, knuckle pads, perniosis, pyogenic granuloma, skin tag and keloid were noted. Two cases of smegma pearls were also noted. One case of onychomadesis was also noted. One case of acquired Epidermodysplasia Verruciformis (EDV) was also documented in a case positive for acquired immunodeficiency virus.

DISCUSSION

Paediatric skin diseases form a major health problem in community. Paediatric skin is different from adult skin and requires special attention. Pattern of dermatological conditions are influenced by various factors such as age, sex, season, socio-economic status, immune status, religion and level of literacy, etc [4]. Since paediatric skin diseases act as a mirror to the socio-economic status and

[Table/Fig-11]: A case of linear scleroderma with limb involvement.

hygiene of community their prevalence can be used as a tool to implement health measures relevant for the community. This study was done to observe the pattern of dermatological conditions in paediatric patients. Data can be useful in planning of healthcare programs for children.

A total of 1,003 patients were recruited in the study. 56.53% (567) were males and 43.47% (436) were females. Male patients outnumbered female patients with male to female ratio 1.3:1. Balai M et al., noted male preponderance with male to female ratio of 1.2:1 [11]. Reddy VS et al., and Shrestha R et al., reported female preponderance in their studies [12,13]. This can be attributed to the fact that male child is given preference over girl child in many parts of northern India which may lead to higher visits of male children in OPD to seek medical services as compared to girl child; which is reflected in present study [14].

Maximum patients were in the age group of 1- 5 years (33.20%), followed by age group of 6-10 years (30.30%) and 11-14 years (27.22%). Karthikeyan K et al., reported maximum number of patients between age group 1-4 years similar to present study [7]. The reason for involvement of children of this age group may be due to high vulnerability of children to infections because of low immunity and poor nutritional status [15]. This may also be due to increased exposure of preschool and school going children to environmental factors.

The most common group of dermatoses in this study was infection (32.40%), followed by infestations (24.83%). Infections and infestations together accounted for 57.23% of all patients. This observation was consistent with studies done by Karthikeyan K et al., (54.5%), Balai M et al., (40.6%) and Reddy VS et al., (33.8%) [7,11,12]. This can be due to lack of hygiene, poor sanitation, poor nutritional status, poor level of literacy in the region.

Bacterial infections (15.25%) were most common infection. Impetigo was the commonest bacterial infection (7.27%) as seen by Balai M et al., [11]. Maximum cases of impetigo were seen in age group 1-5 years. Pyoderma accounted for 5.68% and folliculitis 1.99% of all patients. Karthikeyan K et al., reported secondary pyoderma to be the commonest infection constituting 17.9% of the total disease burden [7]. This may be due to the fact that multiple diagnoses were recorded at the same time in a patient where as in this study presenting complaint was recorded as main diagnosis. As in scabies with secondary infection scabies was recorded as the main diagnosis and secondary complication (pyoderma) was not taken into account separately. Sayal SK et al., reported fungal infection to be commoner than other infections [16]. In study done by Wenk C and Itin PH (Switzerlend) and Gul U et al., (Turkey) viral infections were commoner than bacterial and fungal infection [17,18]. This can be explained by difference in geographical, climatic, socio-economic factors, as these countries have better economic conditions and have cold climate whereas India has hot and humid climate which predisposes to infections. One case of Hansen's disease was recorded (mycobacterial). Though only a single case of polyneuritic (multibacillary) leprosy was recorded; it is still significant. Childhood leprosy (multibacillary) is indicative of ongoing leprosy transmission in community in post elimination phase [19].

Bacterial infections were followed by fungal infections (10.37%). Fungal infections were most common in age group 11-14 years. Amongst fungal infections dermatophyte infections were the most common (6.08%), followed by pityriasis versicolor (3.19%) and candidiasis (0.99%). Tinea corporis was more common in this study while study by Balai M et al., Jawade SA et al., found tinea capitis to be the most common fungal infection [11,20]. Sharma NK et al., however reported candidial intertrigo to be most common fungal infection [5]. The prevalence of fungal infections can be attributed to the humid climatic conditions in this region during monsoons, overcrowding and sharing of clothes.

Fungal infections were followed by viral infections (6.78%). In viral infections molluscum contagiosum was the commonest (2.59%). Karthikeyan K et al., also reported molluscum contagiosum as the most common viral infection [7]. Maximum cases of molluscum contagiosum were seen between age group 6-10 years. MC was followed by warts (1.30%) and viral exanthems (1.20%). Varicella was noted in 1.1% (N=11). Herpes zoster which is very rare in children was seen in three cases. This can be attributed to poor immune status.

Infections were followed by infestations with scabies constituting 24.12% and pediculosis capitis 0.7%. Maximum cases of scabies were noted in 1-5 years of age group. Scabies also constituted the largest individual dermatoses with 24.12% of all the patients in this study. Balai M et al., and Reddy VS et al., also reported scabies as the most common infestation [11,12]. The increase number of infestations may be due to overcrowding, poor living conditions, poor educational status and environmental factors. There was associated history of involvement of family members simultaneously in many cases. Pediculosis capitis was noted in seven patients and all were females. In two school surveys in India done at Himachal Pradesh and Pondicherry pediculosis was the most common infestation [21,22]. The lower incidence in this study may be due to knowledge and availability of over the counter products for lice removal. This study showed high prevalence of infectious dermatoses in children. Similar studies has been presented in [Table/Fig-12] [7,11-13,17].

Second largest group of dermatological conditions were constituted by eczemas with 17.34% of all patients. Karthikeyan K et al., and Reddy BR and Narasimha Rao TV also observed eczema as second most common dermatological manifestation [7,23]. Pawar S et al., reported eczemas and dermatitis as second most prevalent dermatoses with 20.24% of all cases [24]. Atopic dermatitis (4.08%) was the commonest eczema with majority cases observed in age group (1-5) years, a finding similar to Pawar S et al., [24]. Balai M et al., reported higher rates of eczematous disorders with atopic dermatitis as the most common disorder [11]. Sardana K et al., however reported infantile seborrhoeic dermatitis to be more common [25]. Seborrhoeic dermatitis constituted 3.59% in this study.

Hypersensitivity disorders constituted 8.28% of all cases. Urticaria was the most common hypersensitivity reaction (5.18%) with majority cases in 11-14 years of age group. Papular urticaria was seen in 1.89% cases with maximum cases in age group of 1-5. Sardana K et al., observed papular urticaria as the most common hypersensitivity disorder followed by urticaria [25].

S. No.	Author's name and publication year	Place of study	Number of subjects	Age of children considered	Parameters studied	Conclusion
1	Balai M et al., 2012 [11]	Rajasthan, India	1000	Upto 5 years	Age, sex, pattern of dermatome's	Infections and infestations-40.60%, eczemas-34.86%, hypersensitivity disorders-10.22%, pigmentary-2.04%
2	Reddy VS et al., 2016 [12]	Kerala, India	500	Upto 18 years	Age, sex, pattern of dermatoses	Infections and infestations-33.8%, eczemas-32.6%, disorders of sweat and sebaceous glands-7.4%, keratinisation and papulosquamous disorder-4%
3	Shreshtha R et al., 2012 [13]	Nepal	1086	Upto 14 years	Age, sex, pattern of dermatoses	Infections and infestations-42.58%, eczemas-26.46%
4	Karthikeyan K et al., 2004 [7]	Pondicherry, India	2100	Upto 14 years	Age, sex, pattern of dermatoses	Infections and infestations-54.5%, dermatitis and eczemas-8.6%, pigmentary disorders-5.7%
5	Wenk and Itin PH 2003 [17]	Aarau, Switzerland	1105	Upto 16 years	Age, sex, pattern of dermatoses, diagnostic pattern and therapy	Atopic dermatitis-25.9%, pigmented nevi-9.1%, warts-5.0%
6	Current study, 2022	Haryana, India	1003	Upto 14 years	Age, sex, pattern of dermatoses	Infections and infestations-57.23%, dermatitis and eczemas-17.74%, hypersensitivity disorders-8.28%

[Table/Fig-12]: Comparitive evaluation of similar studies [7,11-13,17].

Disorders of sweat and sebaceous gland constituted 5.28%. This finding was similar to study done by Reddy BR and Narasimha Rao TV in which sweat and sebaceous gland disorders contributed to 5.10% [23]. In this study acne (n=33) and miliaria (n=20) constituted 3.29% and 1.99% respectively. Acne was seen mostly in adolescent age group 11-14 as it is a disease of pubertal age group [26]. Miliaria was common in 1-5 years age group. Among the pigmentary disorders which formed 2.49% of total patients maximum patients had vitiligo with 2.09% patients (n=25) followed by three case of freckles and one case of Mongolian spot. Reddy BR and Narasimha Rao TV reported pigmentary disorders in 4.9% of study population, with vitiligo as the predominant pigmentary abnormality [23].

Papulosquamous disorders were seen 2.09% of all cases in present study. Six cases each of psoriasis, lichen planus and pityriasis rosea were noted. The incidence of papulosquamous disorders was found to be 2.05% by Reddy VS et al., similar to present study [12]. Disorders of keratinisation included two cases of ichthyosis (0.2%, n=2). Hair disorders constituted 1.80% (n=18) and alopecia areata (1.60%, n=16) was the most common hair problem. This was similar to study done by Pawar S et al., where alopecia areata was the commonest hair disorder [24]. Among nutritional disorders (0.4%, n=4) there was one case of phrynoderma, one case of cheilitis and two cases of apthous ulcer. In study done by Karthikeyan K et al., nutritional dermatoses were seen in 2.8% cases [7]. Photodermatoses (0.4%, n=4) included four cases of PMLE. In vesiculobullous disorders a single case of epidermolysis bullosa was seen in a newborn (0.1%, n=1).

In connective tissue disorders one case (0.1%) of linear scleroderma was recorded. In study by Reddy VS et al., connective tissue disorders constituted 0.6% of all dermatoses [12]. This study gives an idea about the pattern of dermatological conditions in paediatric population of rural Haryana.

Limitation(s)

Limitation of this study was being unicentric and majority of population catered was of rural strata. Seasonal trends could not be studied due to short duration of present study. Multicentric and large studies are required for better understanding of trends in pediatric dermatoses.

CONCLUSION(S)

This study showed pattern and distribution of dermatological conditions in children from age group 0-14 years in which infections and infestations formed the major disease group followed by eczemas. These are mostly preventable and easily treated. Preventive measures like creating anawareness among children and parents through public health education, improvement of nutrition and socio-economic status will help in reducing burden associated with paediatric dermatoses. This study provided a baseline data about distribution of paediatric dermatoses which was lacking in this region. This study can be used as a reference for future research to determine seasonal variations and role of various intrinsic and extrinsic factors affecting the distribution of skin diseases among children.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: May 24, 2022
- Manual Googling: Jun 24, 2022
- iThenticate Software: Jun 28, 2022 (8%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **May 21, 2022**
Date of Peer Review: **Jun 09, 2022**
Date of Acceptance: **Jun 28, 2022**
Date of Publishing: **Jul 01, 2022**