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A CLINICAL STUDY OF CONGENITAL ICHTHYOSIS IN THE PEDIATRIC AGE GROUP

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ABSTRACT

BACKGROUND:

Congenital ichthyosis is a broad term for a variety of keratinizing conditions characterized by extensive scaling and varying degrees of erythema. Little is known about the disease's effects on families and the quality of life experienced by kids with congenital ichthyosis. Defects in keratinization are the cause of the varied group of illnesses known as ichthyoses. Making prognosis assessments, treatment choices, and providing genetic counseling in patients with ichthyosis require accurate clinical diagnosis. However, clinical variability in some cases makes it difficult to make a definite diagnosis. Ichthyoses are a diverse category of diseases caused by aberrant epidermal differentiation and desquamation, as well as defects in keratinization or cornification. Clinically, it is distinguished by scaling and dry, rough skin that covers much or the entire body surface. Congenital ichthyosis nomenclature and nosology have changed over time, resulting in a bewildering array of terminologies and classification schemes.

AIM: To study the clinical presentation of various types of congenital ichthyosis in the pediatric age group.

MATERIAL AND METHOD:

The Department of Dermatology carried out this cross-sectional observational study. Based on clinical patterns, 50 ichthyosis cases in total were enrolled in the study. For comparative research, the total number of new patients who visited the department throughout the time period was enrolled. A predetermined pattern of questionnaires was used to obtain the history. Itching, reduced sweating, heat intolerance, a history of collodion infant, skin blistering, seasonal variation, cyclical loss of skin, photosensitivity, and photophobia were all topics of inquiry.

RESULTS:

Congenital ichthyosis affected 50 people, with ichthyosis vulgaris accounting for 72% of cases and lamellar ichthyosis accounting for 10%. Bullous ichthyosis form erythroderma (BIE), Sjogren-Larsson syndrome, and non-bullous ichthyosis form erythroderma (NBIE) each made up 2% of the total. Ichthyosis vulgaris was about equally prevalent in both sexes. Lamellar ichthyosis was more common in females. In the NBIE, the distribution of sexes was equal.

CONCLUSION:

There are several distinct types of ichthyoses that have distinguishing characteristics and can be accurately diagnosed. However, due to significant clinical heterogeneity, a definitive diagnosis can be difficult in some patients and families. The diagnosis is generally aided by knowing if ichthyosis is inherited or acquired, present at birth or later in life, and whether it affects only the skin or is a component of a multisystem condition. Other helpful clinical findings include scale quality and distribution, erythroderma presence or absence, blistering, and related abnormalities of the skin adnexa. Recognizing the inheritance pattern requires a good understanding of family history.

KEYWORDS: Congenital ichthyosis, Collodion baby, Ichthyosis Vulgaris and Keratinization

INTRODUCTION:

Ichthyosis is a complex set of disorders defined clinically by dry, rough skin with scaling over much or the entire body surface. These disorders are caused by errors in keratinization or cornification with aberrant differentiation and desquamation of the epidermis. Without the stratum corneum, terrestrial life is impossible because it serves as a barrier to water loss. A defining hallmark of ichthyosis is increased trans-epidermal water loss caused by defective barrier function.[1,2]

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Congenital ichthyosis refers to a diverse range of genetic skin conditions that are all present at birth.[3] The affected children have extensive scaling and varying degrees of erythema beyond the newborn period, or in the case of epidermolysis hyperkeratosis (EHK), very thickened skin and blisters all over the body.[4] The diagnosis of lamellar ichthyosis (LI), Netherton's syndrome (NS), EHK, or Harlequin ichthyosis (HI) is typically confirmed by clinical examinations in conjunction with DNA tests. Ichthyosis currently has no known cure. The lifelong regimen includes regular topical emollient applications, baths, and, for extremely severe symptoms, oral acitretin.[5,6]

A specific genetic abnormality results in a category of keratinization illnesses known as congenital ichthyosis. In the winter, when the patients who are afflicted are particularly psychologically disturbed, these diseases are more prevalent. Ichthyosis is classified as non-syndromic and syndromic based on the 2009 First Consensus Classification. Autosomal recessive congenital ichthyosis includes harlequin ichthyosis, lamellar ichthyosis (LI), and congenital ichthyosis form erythroderma (CIE). Epidermolysis ichthyosis (EI) and superficial EI are two types of keratinopathic ichthyosis brought on by keratin mutations.[7] Happily, the most prevalent of these, ichthyosis vulgaris (IV), is very mild and readily treatable with emollients. But the more severe ones, such as EI (formerly known as bullous ichthyosis form erythroderma [BIE]) and LI, are difficult to cure because of the ectropion, eclabium, and fibrous digital bands that are their associated symptoms. While being aware of these illnesses makes it feasible to cure them with straightforward methods wherever possible and prevent the use of needless medications.

In general, the diagnosis is aided by knowing whether ichthyosis is inherited or acquired, manifests at birth or later in life, and is restricted to the skin or is a symptom of a multisystem condition. Other helpful clinical findings include scale quality and distribution, erythroderma presence or absence, blistering, and related abnormalities of the skin adnexa. Recognizing the inheritance pattern requires a good understanding of family history. Making prognosis assessments, treatment choices, and providing genetic counseling in patients with ichthyosis require accurate clinical diagnosis.[8]

Studies on the quality of life (QoL) of adults with ichthyosis have revealed that their skin disease has significantly impacted them, with childhood being the most challenging time.[8,9] Children's skin conditions are frequently accompanied by poor quality of life.[10,11] There are few studies on children with congenital ichthyosis' quality of life. The current study looked at the quality of life (QoL) of Swedish children with various types of congenital ichthyosis as well as how the disease affected the QoL of the children's relatives. Recognizing the inheritance pattern requires a good understanding of family history. Making prognostic projections and therapy choices for a patient with ichthyosis requires accurate clinical diagnosis.[12] Recent developments in molecular genetics have given us the means to classify ichthyosis according to the underlying genetic abnormality, which facilitates the provision of genetic counseling.[13] Their inheritance pattern is particularly crucial for determining the likelihood that the condition will be passed along to the next generation.

MATERIAL AND METHODS

The Department of Dermatology carried out this cross-sectional observational study. Based on clinical patterns, 50 ichthyosis cases in total were enrolled in the study. For comparative research, the total number of new patients who visited the department throughout the time period was enrolled. A predetermined pattern of questionnaires was used to obtain the history. Itching, reduced sweating, heat intolerance, a history of collodion infant, skin blistering, seasonal variation, cyclical loss of skin, photosensitivity, and photophobia were all topics of inquiry.

History

A predetermined pattern of questionnaires (as specified in the proforma) was used to elicit the history. Concerning symptoms, age of onset, duration, history of collodion infant, blisters, seasonal variation, recurrent skin infection, and atopy, questions were raised. History was taken regarding the involvement of other systems, such as the skeletal system and the central nervous system. History was taken regarding the participation of other systems, such as the skeletal system and the central nervous system (CNS). A history of preterm, extended labor, and any maternal illnesses or medications during the prenatal period were obtained. The family history of comparable lesions in the parents and siblings, as well as the patient's developmental history, were elicited. The history of the parents' consanguineous union was documented. A thorough general examination was carried out, paying particular attention to the CNS and skeletal system.

Clinical examination

A thorough and in-depth systemic and dermatological examination was carried out, along with any necessary investigations. Patients up to the age of fourteen had their scale distribution and character, erythroderma presence, and blister presence as well as any related disorders noted. When certain syndromes were suspected, referrals to other disciplines including neurology and ophthalmology were made to confirm or rule out any linked findings. A head circumference measurement was done, and it revealed signs of short height, microcephaly, cataract, and gait. Skin lesions were inspected under a dermatologist's microscope, and scale characteristics, such as whether they were loose or adhering, polygonal or lamellar, and where they were distributed sparingly, were noted. The presence of impetiginization, erythroderma, ectropion, eclabion, lichenification, and blisters was seen. Alopecia, brittle hair, and nail dystrophy were all checked for in the hair and nails. Hyper-linearity, palmoplantar keratoderma, sclerodactyly, and digital contractures were looked for on the palms and soles.

Laboratory investigations

In each case, a standard hematological study was conducted. In addition to usual hematological testing, skin biopsies and microscopic hair examinations were performed as needed. Referrals to other experts, such as neurologists and ophthalmologists, were made as and when there was a suspicion to confirm or rule out concomitant symptoms of some syndromes.

Inclusion criteria:

- Patients presenting with features consistent with congenital ichthyosis and willing to give written informed consent were included in the study.

Exclusion criteria:

- Acquired ichthyosis
- Malnutrition
- Congenital hypothyroidism
- Acquired immune deficiency syndrome

STATISTICAL ANALYSIS

All the data were compiled and analyzed statistically and inference was drawn. Statistical analysis was done using SPSS version 22.0 was used to analyze the data. To compare the proportions Chi-square test was applied.

RESULT: -

Out of 2000 patients who attended the dermatology outpatient department, the total number of patients with congenital ichthyosis was 50.

Table 1: Relative incidence of different types of congenital ichthyoses

Clinical types	Number of cases (%)
Ichthyosis vulgaris	38 (72)
Lamellar ichthyosis	5 (10)
NBIE	3 (6)
BIE	1 (2)
Netherton's syndrome	1 (2)
Sjogren–Larsson syndrome	2 (4)

Congenital ichthyosis affected 50 people, with ichthyosis vulgaris accounting for 72% of cases and lamellar ichthyosis accounting for 10%. Bullous ichthyosis form erythroderma (BIE), Sjogren-Larsson syndrome, and non-bullous ichthyosis form erythroderma (NBIE) each made up 2% of the total. Ichthyosis vulgaris was about equally prevalent in both sexes. Lamellar ichthyosis was more common in females. In the NBIE, the distribution of sexes was equal.

Table 2: Age of onset of congenital ichthyoses

Types of ichthyosis	Birth	3 months	6 months	1 year
Ichthyosis Vulgaris	-	17	17	2
Lamellar ichtyosis	5	-	-	-
NBIE	3	-	-	-
BIE	1	-	-	-
Sjogren–Larsson syndrome	2	-	-	-
Netherton's syndrome	1	-	-	-

All except two cases of ichthyosis vulgaris had an age onset from 3 to 6 months. Lamellar ichthyosis, NBIE, BIE, and other ichthyosis form syndromes had the age of onset since birth.

DISCUSSION

The incidence of ichthyosis vulgaris in our study was 1 in 170, which is consistent with the findings of Wells and Kerr's study, which indicated that the condition may be as prevalent as 1 in 250 people.[14] In 98% of individuals, ichthyosis vulgaris began between 3-6 months of age. The age of illness onset in lamellar ichthyosis, NBIE, and BIE was from birth. This complies with that of the description of the age of onset of the disease given by **Traupe et al.2014**[15], in the guide to clinical diagnosis of ichthyosis. In **Van Gysel et al.2002**[16] studies of follow-up to 17 cases of collodion babies, 60-80% of the infants developed NBIE and lamellar ichthyosis.

In **Van Gysel et.al 2002**[16] study of follow-up of 17 cases of collodion babies, 60-80% of the infants developed non-bullous ichthyosis from erythroderma and lamellar ichthyosis. Thirteen collodion newborns were studied, and 70% of the patients experienced lamellar ichthyosis, whereas 30% experienced non-bullous ichthyosis from erythroderma. Therefore, there was a 1:2 ratio between the non-bullous ichthyosis type of erythroderma and the bullous ichthyosis form of erythroderma.

A study by **Kuokanen 1969**[17] showed an association of atopy in 37-50% of patients which was 6.5% in our study. In patients with ichthyosis vulgaris, 24% of patients had a history of second- or third-degree consanguineous marriage, while 76% of patients had no such history. Consanguineous marriage was present in 44% of patients with second-degree lamellar ichthyosis and in 55% of patients with third-degree lamellar ichthyosis. This fits the autosomal recessive inheritance model.

Second-degree consanguineous marriage was observed in the parents of people with Netherton's syndrome, which is consistent with autosomal recessive inheritance. 41% of individuals with ichthyosis vulgaris had a family history of the condition. In one household with two affected siblings, there was a positive family history of lamellar ichthyosis. Given that the condition is inherited autosomally dominantly, there is a 25% chance that another kid may also be affected, as was the case in this instance. BIE had no ichthyosis in the family history. It can be assumed that the patient experienced a novel keratin gene mutation because the condition is an autosomal dominantly inherited condition.

Gencoglan et al.2012[18] mentioned the hypopyon lacunae with surrounding septa in lymphangioma circumscriptum. Hypopyon formation can be attributed to the red corpuscles settling down due to gravity and lymph floating over them in the upper half.

Behera et al.2017[19] in their study observed multiple yellow dots against a pinkish-gray background. Here, yellow dots correspond to follicular hyperkeratosis and sebum whereas pinkish-gray background corresponds to proliferating blood vessels and melanin incontinence. **Shinkuma et al.2015**[20] observed reddish-brown strands with white lines in between in shagreen patches which we did not find in our patient.

In one study, the mother of a child with ichthyosis expressed her anger about her son's skin shedding at home. It was discovered in that study that parents of ichthyosis-affected children (n = 2) also bear an additional financial hardship. This is consistent with the study's conclusions about housework and the effect that the cost had on the participants' quality of life.[21] In a study comprising 30 children with different forms of EB,[22] the total CDLQI scores were much higher than the total CDLQI scores in this study. On the other hand, these findings show that ichthyosis worsens children's quality of life more than other skin conditions. To compare the effects of ichthyosis with those of other congenital and chronic disorders on quality of life, extensive new research and general questionnaires are required.[23]

Family members' quality of life was impacted by the disease's severity, the existence of its most severe sequelae, as well as other indications that mostly affected patients' looks. Overall, our findings highlight the importance of providing patients and their families with psychological and socioeconomic assistance in order to ensure optimal global healthcare. Finally, when evaluating patient-reported outcomes during clinical trials, it should include how the secondary disease affects "the greater patient".

CONCLUSION:

There are several distinct types of ichthyoses that have distinguishing characteristics and can be accurately diagnosed. However, due to significant clinical heterogeneity, a definitive diagnosis can be difficult in some patients and families. The diagnosis is generally aided by knowing if ichthyosis is inherited or acquired, present at birth or later in life, and whether it affects only the skin or is a component of a multisystem condition. Other helpful clinical findings include scale quality and distribution, erythroderma presence or absence, blistering, and related abnormalities of the skin adnexa. Recognizing the inheritance pattern requires a good understanding of family history.

Making prognosis assessments, treatment choices, and providing genetic counseling in patients with ichthyosis require accurate clinical diagnosis.

REFERENCES: -

1. Moeschler JB, Shevell M; American Academy of Pediatrics Committee on Genetics. Clinical genetic evaluation of the child with mental retardation or developmental delays. Pediatrics 2006;117:2304-16.
2. Elias PM, Menon GK. Structural and lipid biochemical correlates of the epidermal permeability barrier. Adv Lipid Res 1991;24:1-26.
3. Traupe H. The ichthyoses: a guide to clinical diagnosis, genetic counseling, and therapy. Berlin; New York: Springer Verlag;1989.
4. DiGiovanna JJ, Robinson-Bostom L. Ichthyosis - Etiology, diagnosis, and management. A Clin Dermatol 2003;4:81-95.
5. Vahlquist A, Gånemo A, Virtanen M. Congenital ichthyosis: an overview of current and emerging therapies. Acta Derm Venereol 2008;88:4-14.
6. Ganemo A, Virtanen M, Vahlquist A. Improved topical treatment of lamellar ichthyosis: a double-blind study of four different cream formulations. Br J Dermatol 1999;141:1027-32
7. Phiske M. Ichthyosis and ichthyosis form disorders. In: Majid I, editor. *IADVL Recent* Advances in Dermatology. New Delhi: The Health Sciences Publisher; 2016;1:36–47
8. Ganemo A, Lindholm C, Lindberg M, Sjoden PO, Vahlquist A. Quality of life in adults with congenital ichthyosis. J Adv Nursing 2003;44:412-9.
9. Ganemo A, Sjoden PO, Johansson E, et al. Health-related quality of life among patients with ichthyosis. Eur J Dermatol 2004;14:61-6.
10. Ganemo A, Svensson A, Lindberg M, Wahlgren CF. Quality of life in Swedish children with eczema. Acta Derm Venereol 2007;87:345-9.
11. Holm EA, Wulf HC, Stegmann H, Jemec GB. Life quality assessment among patients with atopic eczema. BrJ Dermatol 2006;154:719-25.
12. Pietrusinski M, Stanczyk-Przyluska A, Chlebna-Sokól D, Borkowska E, Kaluzewski B, Borowiec M, et al. Identification and clinical consequences of a novel mutation in the gene for transglutaminase 1 in a patient with lamellar ichthyosis. Clin Exp Dermatol 2015;40:921-3.
13. Richard G. Molecular genetics of the ichthyoses. Am J Med Genet C Semin Med Genet 2004;131:32-44.
14. Wells RS, Kerr CB. Clinical features of autosomal dominant and sex-linked ichthyosis in an English population. Br Med J 1966;1:947-50.
15. Traupe H, Fischer J, Oji V. Non-syndromic types of ichthyoses - An update. J Dtsch Dermatol Ges 2014;12:109-21.
16. Van Gysel D, Lijnen RL, Moekti SS, de Laat PC, Oranje AP. Collodion baby: A follow-up study of 17 cases. J Eur Acad Dermatol Venereol 2002;16:472-5.
17. Kuokkanen K. Ichthyosis vulgaris. A clinical and histopathological study of patients and their close relatives in the autosomal dominant and sex-linked forms of the disease. Acta Derm Venereol Suppl (Stockh) 1969;62:1-72.
18. Gencoglan G, Inanir I, Ermertcan AT. Hypopyon-like features: New dermoscopic criteria in the differential diagnosis of cutaneous lymphangioma circumscriptum and haemangiomas? J Eur Acad Dermatol Venereol 2012;26:1023-5.
19. Behera B, Kumari R, Gochhait D, Sathya AB, Thappa DM. Dermoscopy of adenoma sebaceum. J Am Acad Dermatol 2017;76:86-8.
20. Gundalli S, Ankad BS, Ashwin PK, Kolekar R. Dermoscopy of shagreen patch: A first report. Our Dermatol Online 2015;6:331-3.
21. Basra MK, Finlay AY. The family impact of skin diseases: the Greater Patient concept. Br J Dermatol 2007;156:929-37.
22. Horn HM, Tidman MJ. Quality of life in epidermolysis bullosa. Clin Exp Dermatol 2002;27:707-10.
23. Beattie PE, Lewis-Jones MS. A comparative study of impairment of quality of life in children with skin disease and children with other chronic childhood diseases. Br J Dermatol 2006;155:145-51