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Original Research Article

ROLE OF SERUM VITAMIN A IN CHALAZION

Shefa Habib[1], MD Raghib Tauheed[2], Vivek Kumar[3]

[1]*Senior Resident, Department of Ophthalmology, SBMCH, Hazaribagh, India*
[2]*Senior Resident, Department of Ophthalmology, Pjmch,Dumka*
[3]*Specialist Medical Officer, Department of Ophthalmology, SBMCH,,Hazaribagh, India*

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Corresponding Author:
Dr. Vivek Kumar
Specialist Medical Officer, SBMCH, Hazaribagh, India.
Email: vivekkumar777@gmail.com

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ABSTRACT

Background: Chalazion is a chronic localized lipogranulomatous inflammation of meibomian gland. Since deficiency of S.VIT A cause hyperkeratosis of duct, study was aimed to find out if there is any association b/w vit A deficiency & occurrence of chalazion.

Materials and Methods: This is a cross sectional study performed in a tertiary centre of Jharkhand b/w August 2019 to January 2020 involving 60 individuals (30 with chalazion& 30 normal healthy person). Blood sample were drawn and S.vitamin A level were assessed using HPLC.

Results: It was seen that serum Vitamin A level in patient with chalazion were lower than normal healthy individual and in patient with recurrent multiple chalazion(p=0.025) were significantly lower than patient with recurrent single chalazion(p=0.03).

Conclusion: VIT A deficiency may be considered having an association with occurrence of chalazion

Keywords: chalazion, recurrentchalazion, multiple chalazion.

INTRODUCTION

Chalazion is a chronic, localized lipogranulomatous inflammation involving either the meibomian or Zeis glands. It Often occurs secondary to non-infectious obstruction of the sebaceous gland ducts.[1]Chalazia are highly prevalent in ophthalmological practice and their rate of recurrence may be up to 35%.[2,3] Most of the time they are the result of retention of lipid material in the sebaceous gland.

Various risk factors are found to be associatedlike blepharitis, rosacea, gastritis, anxiety, irritable bowel syndrome, smoking, and infection by viruses or Demodex brevis,[2-4] In young subjects, deficiency of vitamin A is found to be risk factor in some study.[5-7] Irrespective of the cause, they produce sign & symptoms ranging from mild degree of discomfort producing cosmetic disturbance or uncomfortable conjunctivitis tokeratitis leading to spherical aberration.[6]. Histopathologic findings shows an obstruction and dilatation of the ducts of the Meibomian glands, and typical presence of lipid-filled Touton-type giant cells with a foamy appearance of the cytoplasm which reflecting the abundance of fat and also a varying degree of cells which are involved with the process of inflammation.[3,7]

Vitamin A is necessary for the normal growth, regeneration, differentiation, and stability of epithelial tissues, and its deficiency leads to loss of goblet cells, increased epidermal keratinization, and squamous metaplasia of the mucous membranes, including the conjunctiva.[5]Deficiency alsocauses hyperkeratosis in the meibomian gland ducts and consequently leads to obstruction of these ducts.[7]

In another study, it was found that in a vitamin A-deficient rat it presentswith structural abnormalities of the epithelial basement membrane and loose epithelial adhesion that result in poor healing of cornea.[8] It has estimated that about 140 million children worldwide have vitamin A deficiency, which is the second most prevalent nutritional disorder after protein-calorie malnutrition.[9] The extent of vitamin A deficiency varies across different parts of the globe, possibly affecting the development of chalazion differently. In this study, we determined the serum levels of vitamin A in patients with chalazion at the local level since there are few evidences in this subject.

MATERIALS AND METHODS

This was a cross sectional study that included 60individuals (30patients with chalazion and 30control subjects). The study was conducted at the Regional institute of Ophthalmology of Rajendra institute of medical science,Ranchi, Jharkhand between August 2019 to January 2020. Written consent was obtained from the parents of the child participants and from the adult participants before blood sampling. To minimize bias and for the best age, socioeconomic and nutritional status matching, the control subjects were selected from among the patients'family members with the closest age difference. All subjects were divided into three groups: 7–12 years old, 13–19 years old, and more than 19 years old. Patients were further divided into subgroups based on the type of chalazion: single, multiple, primary, and recurrent. Exclusion criteria were as follows: patients with fat malabsorption diseases, chronic alcoholism, long-term zinc therapy, long-term antacid therapy, chronic laxative abuse, antihyperlipidemic drug use, colchicine therapy, and those who refused to participate in the study. Blood samples were collected and the serum was tested for levels of vitamin A using high-performance liquid chromatography (HPLC). The following concentrations were regarded as the normal ranges of serum vitamin A levels: 0.2–0.4 g/ml for 1–6 years of age, 0.26–0.4 g/ml for 7–12 years of age, 0.24–0.72 g/ml for 13–19 years of age, and 0.3–0.8 g/ml for >19 years of age. Statistical analysis was performed using the generalized linear model. For multiple comparisons, data were adjusted using unpaired t- test.

RESULTS

Twenty-four (80%%) patients had single chalazion and six patients (20%) had multiple chalazia. Primary chalazion was seen in seventeen patients (56.6%) andseven patients (49.4%) had recurrent chalazion. Demographic data of patients with chalazion& control subjects:

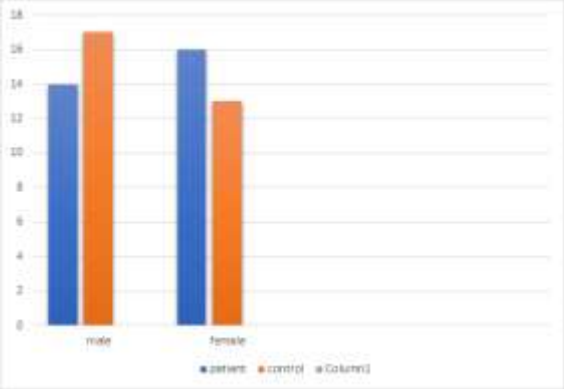

Table 1

CHARACTERISTICS	S. VITAMIN A LEVEL	
AGE	PATIENTS	CONTROL
7-12 yr	0.180 ± 0.032	0.39 ± 0.043
13-19yr	0.250 ± 0.069	0.42 ± 0.064
>19 yr	0.295 ± 0.056	0.37 ± 0.054

The average serum vitamin A levels in patients with recurrent multiple chalazion were0.182± 0.0512 g/ml (p=0.03)& in recurrentsinglechalazion 0.208+-0.045while in control 0.303 ± 0.057 g/ml, respectively. To minimize bias, we compared the average serum vitamin A levels in patients of each age group with the levels of the corresponding control groups. Average serum vitamin A levels in patients with chalazion were significantly lower than in their control counterparts.

Comparison of serum vitamin in a patient withVitamina:

1.PATIENT	Serum Vitamin A Level	P value
A. Recurrent Single	(0.208± 0.045)	(0.03)
B. Recurrent Multiple	(0.182 ± 0.0512)	(0.025)
2.Control	(0.303 ± 0.057)	

Serum vitamin A levels in patients with recurrent, multiple chalazia (0.182 ± 0.0512 g/ml) were significantly lower than those with recurrent, single chalazion (0.208 ± 0.045 g/ml, P =0.03).

DISCUSSION

Our study suggests that low serum vitamin A is associated with recurrentchalazia. As we all know Vitamin A deficiency causes keratinization of the epithelial cells of the meibomian gland ducts and that could be one of the reason of obstruction of the ducts leading to accumulation of gland secretions.[7] Any inflammatoryprocess further worsen it.[11]Meibomiangland ducts are thinner and more susceptible to obstruction due to keratinization in younger age. vitamin A deficiency can be correlated with keratinization,[6] and perhaps more serious obstruction, which could explain the low levels of serum vitamin A in patients with recurrent, multiple chalazia.

From a study conducted on children from the southwest region of China, it was found that the average serum vitamin A levels of patients with single chalazion or multiple chalazia were significantly lower than those of the control group.[6]

Our study also revealed low serum vitamin A levels with chalazion.

The current study has certain limitations. First, the patients were selected from single tertiary centre which may lead to selection bias. Second, the sample size was small, which may lead to decreased statistical power. Therefore, studies with more cases are needed to support the data from this study.

In conclusion, serum vitamin A levels were significantly lower in patients with chalazion than in control subjects. This information could be helpful for the early diagnosis and treatment of vitamin A deficiency, which could prevent further complications such as xerosis and nyctalopia.

CONCLUSION

VIT A deficiency may be considered having an association with occurrence of chalazion

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