Original Article

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Otorhinolaryngologic Manifestations in Thalassemia Major Patients

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Abstract

Objective: In thalassemia major, extramedulary hematopoiesis results in bony deformities such as sever malocclusion in the head and neck, delayed pneumatization of paranasal sinuses and so on. Also, there are many systemic and iatrogenic problems that may affect the head and neck region. The purpose of this study was to determine otorhinolaryngologic manifestations as clinical diseases in thalassemia major patients.

Material & Methods: In a cross sectional study 190 thalassemia major patients were evaluated (by history and physical examination) for snoring, epistaxis, nasal obstruction, sinusitis, temporomandibular joint (TMJ) pain and TMJ dislocation, tinnitus and hearing loss. Radiological studies of the skull and paranasal sinuses and audiological tests were performed. The data was analyzed in different age groups with chi^2 test.

Findings: Relative frequency of some otorhinolaryngologic manifestations in this population was high. The differences between some clinical diseases as TMJ pain, and epistaxis in different age groups were statistically significant.

Conclusion: Thalassemia major increases some clinical diseases in the Otolarygology field. With early diagnosis and early treatment many of them may be prevented.

Key Words: Thalassemia major, Desferrioxamine, Temporomandibular joint, Bony deformities, Epistaxis, Hearing loss

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Introduction

Thalassemias are hereditary disorders characterized by a reduction in the synthesis of normal globin chains (alpha or beta). Reduced synthesis of normal globin chain causes hemoglobinopathy, and eventually produces different grades of hypochromic microcytic anemia. The thalassemia is classified as alpha or beta thalassemia depending on the affected chain. Affected children are normal at birth, but children with thalassemia major develop severe anemia that requires transfusion during the first year of life. Signs of thalassemia typically presents after 6 months of age, the time when hemoglobin synthesis switches from hemoglobin F to hemoglobin A. These patients have growth failure, bony deformities (abnormal facial structure, pathological fractures), hepatosplenomegaly and jaundice [1,2]. Because of intense marrow hyperplasia, expansion of bones occur which leads to prominence of the cheek bones that tends to obscure the base of the nose and to expose the upper teeth [3,4]. Thickening of the cranial bones produces frontal bossing [5]. Pneumatization of sinuses is delayed and overgrowth of the maxilla produces severe malocclusion [2, 5].

The disturbances of craniofacial growth represents the typical thalassemia facies [2,4]. Bleeding tendencies, due to splenomegaly and in the absence of thrombocytopenia may be seen and epistaxis is particularly common [5].

Ear impairment due to extramedullary marrow growth in the middle ear has been reported, especially in those patients where transfusion was avoided [2]. Marrow expansion may lead to pathological fractures and sinus and middle ear infection due to ineffective drainage [5]. Also, a high frequency sensorineural hearing loss is observed in a large percentage of patients during intensive Desferrioxamine therapy [2, 5, 6].

All of these changes can be ameliorated, delayed, or prevented with transfusion therapy; meanwhile sensorineural hearing loss should be detected early. Significant improvement has been observed after reduction of the Desferrioxamine dose [2]. The purpose of this study was to determine otorhinolaryngologic manifestations in talassemia major patients.

Material & Methods

In this cross sectional study 190 patients with thalassemia major who came weekly for blood transfusion at the Seied-al-shohada hospital (affiliated to Isfahan University of Medical Sciences) entered in this study from 2001-2003. Thalassemia in these patients was confirmed by hemoglobin electrophoresis. History tacking and examination in theses patients focused on snoring, epistaxis, nasal obstruction, postnasal drainage (PND), sinusitis, temporomandibular joint (TMJ) pain, dislocation, tinnitus and hearing loss.

Physical examination of the facial framework and TMJ, otoscopy of the ears, audiological tests and radiology of skull and paranasal sinuses were performed. The data were analyzed with Chi-square test.

Findings

One hundred ninety patients consisted 96(51.5%) were females and 94 (49.5%) males. As mentioned, diagnosis of thalassemia major was confirmed by alone hemoglobin electrophoresis. All of them received desferrioxamine (DFO) with mean daily administration of 29.69 mg/kg and mean therapeutic index of 0.01mg/lit.

Two patients (1.1%) had a history of past otolaryngologic surgery (without surgery of PNS or nasal surgery). Twenty-four patients (12.8%) had history of nasal obstruction and nasal polyposis, 36 (19.1%) had snoring, 6 (3.2%) PND, 2 patients (1.16%) had sinusitis and 4 (43.6%) epistaxis. Only 7 cases (3.5%) had tinnitus and hearing loss; from these, one case had a history of ear surgery (COM), and one case had a sudden sensorineural hearing loss. Audiologically, 80 patients out of 160 cases (50%) in whom audiometry was performed, had sensorineural

Table 1- The relative frequency of symptoms in thalassemia patients

Symptoms	Percent
snoring	19.1
sinusitis	1
Epistaxis	43.6
TMJ pain	2.1
TMJ dislocation	5.3
Hearing loss (clinical)	3.5
Hearing loss (audiometrical)	50

hearing loss; 28 of whom (17.5%) having significant hearing loss (i.e. >20 dB in two consecutive, or > 40 dB in one frequency). This hearing loss was generally at high frequency and in most cases subclinical.

For statistic tests and for tracing maxillofacial deformity effects and systemic effects, the patients were categorized in seven age groups: 0-5 years, 5-10 years, 10-15 years, 15-20 years 20-25 years, 25-30 years, and more than 30-years old. No significant differences were seen in the different age groups (Chi square test P>0.1) for Nasal obstruction and Polyposis, PND, snoring, Nasal surgery, Maxillofacial deformities, and sinusitis.

Statistically significant differences were seen for: epistaxis (P<%13), and TMJ pain (P<0/0001) in different age groups.

Discussion

Thalassemia is hereditary disorder characterized by a reduction in the synthesis of normal globin chains. Desferrioxamine (DFO) is the most efficient iron chelating agents that decreases iron overload in thalassemia major patients. Unfortunately, it also has many toxic effects; most of which can be avoided by extreme care in drug monitoring [5,6]. The greatest concern of iron therapy is sensorineural toxicity. This causes a high frequency sensorineural hearing loss that sometimes may be symptomatic, and its incidence in most reports ranges from 20%-30% [5,6]. The amount of DFO dose, and DFO Therapeoutic Index (TI) are two of the most important risk factors. The recommended dose is less than 40 mg/kg/day, and TI less than 0.025 [5,6, 7].

After multiple searches, no similar study was found in the literature. Increase in TMJ pain with aging shows those maxillofacial deformities in thalassemia patients' increase with age.

Clinical symptoms such as snoring and TMJ pain, indicators of maxillofacial deformity were seen, as 19.1% of patients had snoring and 3.1% of pts under study had maxillofacial deformities. With aging, the incidence of these lesions (without treatment) was increased. The relative frequencies of symptoms are shown in table 1. All maxillofacial changes in thalassemia major can be ameliorated, delayed, or prevented with transfusion therapy.

Conclusion

In conclusion, we emphasize that due to a relatively high incidence of maxillofacial deformities, toxicity of DFO and possibility prevention of these lesions with early and correct treatment (e.g. blood transfusions, and DFO dose adjustment), to prevent these lesions with early diagnosis and treatment.

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