

## RISK FACTORS FOR TEMPOROMANDIBULAR JOINT ANKYLOSIS IN DIFFERENT AGE GROUPS

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### ABSTRACT

**Objective:** To identify the risk factors responsible for the development of Temporomandibular Joint ankylosis.

**Materials and Method:** The study was carried out in the Department of Oral & Maxillofacial Surgery at King Edward Medical University, Lahore, Pakistan from April 2005 to April 2009. Two hundred patient with Temporo mandibular Joint Ankylosis were recruited in this study. To identify the risk factors, patients were divided in different groups according to their age so that the most common risk factor was identified amongst these patients. The groups were A. 6 months to 8 years, B. 9-17 years, C. 18-25 years D.> 25 years. Risk factors identified were history of fall, road traffic accident, middle ear infection, autoimmune diseases and no obvious history.

**Results:** The highest percentage of the patients belonged to Group B (50%) and history of fall was the main risk factor in the development of Temporomandibular joint ankylosis (72.5%) with  $p$  value < 0.05.

**Conclusion:** Trauma is the major factor of Temporomandibular joint ankylosis in all age groups in Pakistan. In this context, we conclude that this complication is a preventable entity if early post traumatic rehabilitation is instituted.

**Key Words:** Temporomandibular joint ankylosis, Risk factors, Age groups.

### INTRODUCTION

The word Ankylosis has its origin in the Greek language, meaning 'stiff joint'.<sup>1</sup> Temporomandibular joint (TMJ) is a bilateral diarthrodial joint. This unique joint can perform both hinge and sliding function and is the only synovial joint in humans where the articulating surfaces are covered by fibrocartilage.<sup>2</sup> True TMJ ankylosis is an intracapsular union of the disc-condyle complex to the temporal articular surface that includes fibrous adhesion or bony fusion between condyle of mandible and glenoid fossa and articular eminence of squamous temporal bone.<sup>3</sup> TMJ ankylosis associated with trauma, local or systemic infection, degenerative joint diseases, surgical intervention of the joint space and neoplasms.<sup>4</sup> Trauma is the leading cause of the

TMJ ankylosis but other rare conditions such as ankylosing spondylitis and septic arthritis can also cause ankylosis.<sup>4,5,6</sup> TMJ ankylosis is an affliction that greatly compromises the quality of life of many patients particularly young adults.

TMJ ankylosis is a very distressing structural condition that denies the victim from the benefit of normal diet and opportunities in careers that require normal speech.<sup>7,8</sup> When it occurs in a child, it can have devastating effects on the future growth and development of the jaws and teeth. Furthermore, in many cases, it has a profoundly negative influence on the psychosocial development of the patient because of the obvious facial deformity.<sup>9</sup> Gap arthroplasty with inter position is performed to prevent the development of reankylosis.<sup>10,11</sup> The incidence of TMJ ankylosis is declining in Europe and North America, partly as a result of better, earlier management of condylar fractures and partly because the use of antibiotics which have reduced persistence and recurrence of infection. TMJ ankylosis is relatively common in developing countries like Pakistan mainly resulting from childhood trauma.<sup>12</sup> Parents either ignore the after

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effects of trauma or the patients are not properly managed in hospitals at the time of injury.<sup>13</sup>

**MATERIALS AND METHODS**

This retrospective study was carried out at the Department of Oral & Maxillofacial Surgery at King Edward Medical University, Lahore, Pakistan, from April 2005 to April 2009. Two hundred patients with limited mouth opening and radiographically proven true TMJ ankylosis were included in this study. Any limitation due to extra articular cause was not included in this study. Patients were distributed in 4 groups according to age to identify the most common risk factor for the development of true TMJ ankylosis. These groups were: A. 6 months to 8 years, B. 9-17 years, C. 18-25 years D.> 25 years. Demographic information like name, age and gender were recorded. A detailed history was obtained and type and severity of symptom as well as duration of the joint ankylosis were also noted. Emphasis was given to any history of fall, road traffic accident, local or systemic infection, degenerative joint diseases and joint surgery. Patients were asked about any previous treatment for joint ankylosis. Systemic examination of all patients was carried out so that critically ill patients were not included in this study. Both intra oral and extra oral examination and relative findings regarding patient mouth opening, chin deviation, and occlusal relationship were recorded. Radiographic examination of the temporomandibular joint was done in all patients. An Orthopantomogram (OPG) was taken for each patient to aid in reaching a definite diagnosis. The patient was diagnosed with either Unilateral or Bilateral TMJ ankylosis. The collected information were analyzed using SPSS version 11. The chi square test was used to determine any association between risk factors in different age groups. P value < 0.05 was taken as significant.

**RESULTS**

A total of 200 patients were included in this study. Out of these 50% patients (n = 100) belonged to Group B followed by 25% patients (n = 50) in Group A. The details of age group distribution are given in Table 1. In TMJ ankylosis, multiple risk factors were involved but patients with a history of fall consisted of 72.5% (n = 145) of the cases. Road traffic accident (RTA) was risk factor in 13.5% (n = 27) of the patients. In 9% (n = 18) of the cases patients did not mention any risk factor and were labeled as cases with unknown risk factors. The details of risk

factors are given in Figure-2. P value was < 0.05 for fall as risk factor and it was considered a significant risk factor in the development of TMJ ankylosis in different age groups. History of fall as risk factor was present in 26.9% of the cases in Group A, 55.9% of the cases in Group B and 10.3% of the cases in Group C. Road traffic accident was a risk factor in 11.1% of the cases in Group A, 29.6% of the case in Group B, 22.2% of the cases in Group C and 37% of the cases in Group D. The distribution of risk factors in different age groups is shown in Table 2. Patients with unknown risk factor were present in all groups. In Group A= 22.2%, Group B= 38.9%, Group C= 22.2% and Group D= 16.7% of the cases were labeled as patients with unknown risk factor. In this study 53% of the patients did not receive any specialist consultation/ treatment while 47% patients were treated for soft tissue injuries after fall and road traffic accident from local hospitals.

**DISCUSSION**

Trauma is a common and well proven cause of TMJ ankylosis. Injury to the joint structure and adjacent soft tissue causes haemorrhage and inflammation. The subsequent fibrosis and /or bone formation can produce permanent limitation of the jaw movement i.e. ankylosis.<sup>12,13</sup> At birth, trauma may

**Table- 1: Distribution of Patients in age groups**

Age Groups in years		n	%
Group A	1/2 - 8	50	25.0
Group B	9-17	100	50.0
Group C	18-25	25	12.5
Group D	>25	25	12.5
Total		200	100

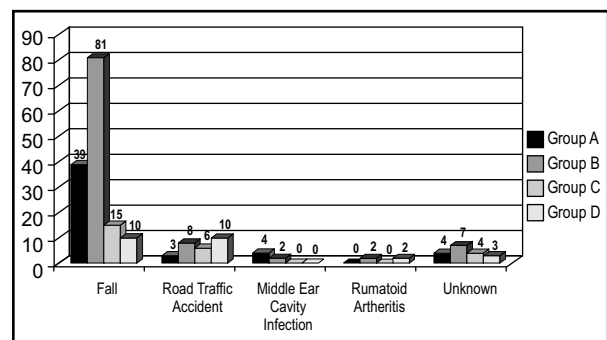


Fig. 1: Frequency of Risk Factors in Age Groups

Table 2: Distribution of the Risk Factors in Age groups

Risk Factors	Age distribution									
	Group A		Group B		Group C		Group D		Total	
	n	%	n	%	n	%	n	%	n	%
Fall	39	26.9	81	55.9	15	10.3	10	6.9	145	100
Road Traffic Accident	3	11.1	8	29.6	6	22.2	10	37	27	100
Middle Ear Infection	4	66.7	2	33.3	0	0.0	0	0.0	6	100
Rheumatoid Arthritis	0	0	2	50.0	0	0.0	2	50.0	4	100
Unknown	4	22.2	7	38.9	4	22.2	3	16.7	18	100

be caused by forces sustained directly to the joint region or transmitted from another part of the mandible during forceps delivery. Some degree of facial paresis or paralysis may be noted immediately after the injury.<sup>14,15</sup> In 2001, Warraich and Cheema<sup>16</sup> reported that 53% of the patients with TMJ ankylosis belonged to 10 to 20 years of age with a mean age of 12 years and this finding co relates with the present study as majority of the patients belonged to Group B with a mean age of 13.3 years. Li et al<sup>17</sup> and He et al<sup>18</sup> in their studies reported that majority of the TMJ ankylosis patients were male and their age ranged from 5 to 52 years with the mean age of 23 years in contrast to 13.3 years in the present study. However it is worth mentioning here that Li et al<sup>17</sup> and He et al<sup>18</sup> considered only those cases in which the risk factor was trauma and due to condylar fractures patient developed TMJ ankylosis. Sharma and Dave<sup>19</sup> reported 67.8% cases associated with trauma and 17% with infection. Su-Gwan<sup>9</sup> found trauma (85.7%) was the major cause of unilateral TMJ ankylosis in adult patients. In all these studies, trauma to the TMJ was the main risk factor for ankylosis and our result was consistent with their findings as in 86% of the cases trauma (Fall + Road traffic accident) was the predominant risk factor for TMJ ankylosis in our study.

In Group B, 55.9% of the patients developed TMJ ankylosis due to fall. In this age group children are involved in different sports and bicycle riding. Fall from bicycle or falling on the ground during sports are the main events where trauma to the TMJ will cause any sub condylar or intra articular condylar fracture and will lead to ankylosis. Fall from the roof top while flying kites is very common in this part of the world and most of the case of fall in our study were because of kite flying.

Inflammation of the joint due to the direct extension of infection from other sites includes otitis media, mastoiditis, osteomyelitis of the temporal bone or condyle and soft tissue abscesses.<sup>20,21</sup> With the advent of antibiotics the incidence of TMJ ankylosis due to infections has reduced.<sup>21</sup> Middle ear infection was risk factor in 66.7% of the cases in Group A and 33.3% of the cases in Group B. Padgett observed that frequency of infection as etiologic agent ranges from 44% to 68%. Topazian found that infection was the etiology of TMJ ankylosis in as many as 68% cases.<sup>22,24</sup>

Rheumatic or degenerative diseases include rheumatoid arthritis, ankylosing spondylitis and psoriatic arthritis. Rheumatoid arthritis is another significant cause of TMJ ankylosis and is particularly devastating in juvenile patients.<sup>21,23</sup> Bony ankylosis of TMJ occurred as a result of rheumatoid arthritis and the main characteristics of polyarthritis were also present. Due to its early onset and insidious, progressive nature, Still's disease and its concomitant jaw immobility, results in facial deformity and markedly underdeveloped lower third of the face. In adults with wide spread rheumatoid arthritis, about 50% of its victims have pathology in the TMJ.<sup>23,24,25</sup> In our study, Rheumatoid arthritis was the risk factor for the TMJ ankylosis in Group B and D (50% each). Total number of the patients was four, two from each group. In Group B, it was the juvenile form which affected two patients and apart from the joint symptoms these patients also presented other systemic symptoms for which they were receiving medical therapy. In Group D, two patients developed TMJ ankylosis due to rheumatoid arthritis and this was the adult age group. Patients with rheumatoid arthritis risk factor were referred from Medical Units for the expert opinion regarding their TMJ condition.

**CONCLUSION**

Trauma, in the form of fall or road traffic accident, is the major risk factor of TMJ ankylosis in Pakistan.

**RECOMMENDATION**

- 1- Oral and maxillofacial surgeons play a major role to decrease the incidence of post-traumatic TMJ ankylosis. Therefore this specialty needs to be introduced at Tehsil and District levels.
- 2- Awareness of dental/medical practitioners regarding TMJ ankylosis. Patients with history of fall or RTA and having tenderness over TMJ or a wound over the chin need complete evaluation to prevent TMJ ankylosis.

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