Original Article

Evaluation of Weight Loss in Patients Treated With Mandibular Fracture at Tertiary Care Hospital

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ABSTRACT

Objective: To evaluate the weight loss in patients treated with mandibular fracture at tertiary care hospital.

Study Design: A descriptive study

Place and Duration of Study: This study was conducted at the Department of Oral and Maxillofacial Surgery, Jinnah Post Graduate Medical Centre, Karachi, from September 2023 to March 2024.

Methods: A validate questionnaire was selected to record the patient's demographic data like age, gender, socio economic status, residential status and level of education. Also history and outcome were inquired like smoking, etiology of fracture, fixation of mandibular with or without IMF and weight loss (Yes/No). Effect modifiers like age, gender, socio economic status, residential status, etiology of fracture and type of fixation with or without IMF were controlled by stratification. Post stratification chi-square test or fisher exact test was applied to see their effect on the presence of weight loss. P value equal or less than 0.05 was considered as significant.

Results: In our study, majority of cases were treated without intermaxillary fixation (IMF) 47 (65.3 %) while 25 (34.7 %) with IMF. Mean base line weight of our study cases 70.08 ± 11.14 kg, after 4 weeks weight 68.0 ± 10.90 kg and mean weight loss 2.07 ± 0.94 kg were noted. Of these 72 cases, the weight loss was noted in 23 (31.9 %).

Conclusion: High frequency of weight loss was noted in patients who were treated with or without intermaxillary fixation (IMF). Weight losses in our patients were significantly associated with increasing age.

Key Words: Evaluation, Weight Loss, Mandibular Fracture, Tertiary Care Hospital, Fixation

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INTRODUCTION

Being the largest bone on the face, mandible occupy lower third of the face making it most prominent bone to cause fractures[1]. Due to its fragility, the mandible is more likely to fracture in some main areas, such as condylar neck, canine region, and the angle[1]. According to literature the rate of fractures of mandible were reported in range from 15.5 to 59 percent[2]. Mandibular fractures are treated conservatively with closed reduction and intermaxillary fixation, as well as surgically with open reduction and rigid internal fixation. Numerous publications have been written about treatment options and strategies[3-4].

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Mandibular fractures are serious form of oral trauma, but they are localized disorders of the oral region. Unlike other bone fractures in the body, in this type of oral trauma no normal life activities are effected other than eating, if there is no other type of trauma is present. This implies that rehabilitation strategies during and post-therapy can differ from those for other body injuries[5]. Nutrition in the forms of enteral, parenteral, and oral sip feeding plays a vital role in providing nutritional care since healing becomes difficult in malnourished, severely sick, elderly, and patients with lengthy hospital stays[6].

Nutritional intake is compromised due to Maxillomandibular fixation or MMF used for treating mandibular fractures leading to weight loss and poor QoL (Quality of Life) [7]. A patient's functional and organic changes throughout therapy must be taken into consideration when creating a rehabilitation plan for a jaw fracture patient. Weight loss after jaw fractures has similar outcomes according to literature. In a report by Popat et al, among the two groups one group (Group 1) received a diet plan from dietitian after counselling and other group (Group 2) was instructed to consume protein supplements with liquid diet in the form of milk, shakes and juices of their own choice. At fourth week of follow-up the patients of first group lost significantly lesser weight than second group (p=0.001)

[7]. In another study by Ludwig et al no difference in weight (outcome variable) was noticed between both groups (p=0.46) (8). Other changes in the body were also reported in some studies apart from just weight loss in patients with mandibular fracture. For example, Ruslin as al. observed weight loss in 30.87 percent patients with and without IMF, while Christensen et al. reported that the final model of the study projected highest weight loss of 4.9 percent of the original body weight by day 49 [9-10]. According to another study, prior to IMF, the mean weight of the patients was 69.45kg ranging from 49 to 98kg. The mean weight was decreased to 66.81kg (approximately 2.64kg weight decreased) after four weeks (p=0.025). One patient was noticed to have the most weight loss i.e. 5kg[11].

Since no similar study has been conducted in Pakistan, the suggested study assessed the percentage change in weight from baseline in terms of weight loss in patients with mandibular fractures during therapy.

METHODS

This descriptive study was conducted from September 2023 to March 2024 in the Oral and Maxillofacial Surgery Department at Jinnah Post Graduate Medical Center, Karachi. The sample size is calculated to be 72. The sample was gathered via non-probability ordered sampling. Inclusion criteria for the study was as follows; both male and female patients of age 20 to 60 years with jaw fractures treated with or without IMF along with patients agreeing to the consent were included in this study. Patients with severe medical disorders such as end stage renal disease, hypertension, or diabetes, and patients on immune-suppressants or steroids were not included in the study.

The ethical committee of Jinnah Post Graduate Medical Centre, Karachi approved this study. The patients that met inclusion criteria were chosen after taking history and complete examination from the inpatient and outpatient department of Oral & Maxillofacial Surgery, Jinnah Post Graduate Medical Centre, Karachi. After clarification of the protocol for the study, data usage for research, and risk-benefit ratio to the selected individuals, signed written consent was obtained for any question that could have been asked. The demographic information of the patient, including gender, age, residence status, socioeconomic status, and level of educational, was recorded using an approved questionnaire. In accordance with operational criteria about history and results, questions on smoking, jaw fixation with or without IMF, the cause of the fracture, and weight loss were also asked. Case proforma, specifically designed to record all the outcomes, was used.

Statistical Package for the Social Sciences (SPSS) version 22 was used for data analysis. For both the quantitative and qualitative factors, descriptive statistics were provided. For quantitative information such the patient's age and weight, the mean ± standard deviation was determined. To determine their impact on the likelihood of loss of weight, the Fisher Exact Test or the Post-Stratification Chi-Square Test were used. A P value of 0.05 or less was regarded as significant. The Shapiro-Wilk test was performed to verify the normality.

RESULTS

Our study comprised of a total of 72 patients meeting inclusion criteria of our study. Of these 72 study cases, 58 (80.6 %) were male patients while 14 (19.4 %) were female patients. (Table No. 1). Mean age of our study cases was 33.13 ± 9.44 years (with minimum age of our study cases was 20 years while maximum age was 60 years). Of these 72 study cases, 25 (34.7 %) belonged to rural areas and 47 (65.3 %) belonged to urban areas. Poor socioeconomic status was noted in 16 (22.2%) while 54 (75 %) were middle income and only 2 (2.8 %) were rich population. (Table No. 1).

The etiology of fracture showed that the majority of our study cases were fractured due to road traffic accident (RTA) followed by fall, sport injury and assault 42 (58.3 %), 14 (19.4 %), 12 (16.7 %) and 4 (5.6 %) respectively. In our study, majority of cases were treated without intermaxillary fixation (IMF) 47 (65.3 %) while 25 (34.7 %) with IMF. (Table No. 2).

Mean base line weight of our study cases 70.08 ± 11.14 kg, after 4 weeks weight 68.0 ± 10.90 kg and mean weight loss 2.07 ± 0.94 kg were noted. (Table No. 2).

Of these 72 cases, the weight loss was noted in 23 (31.9 %) and it was stratified with regards to gender, age, socio economic status, residential status, etiology of fracture and type of fixation with or without IMF. (Table No. 3).

Table No. 1: Baseline Characteristics

Gender	Frequency	Percentage
Male	58	80.6
Female	14	19.4
Total	72	100
Residential status	Frequency	Percentage
Rural	25	34.7
Urban	47	65.3
Total	72	100
Socioeconomic status	Frequency	Percentage
Poor	16	22.2
Middle Income	54	75
Rich	02	2.8
Total	72	100

Table No. 2: Etiology, Type of Fracture and Weight Loss

Etiology of fracture	Frequency	Percentage
RTA	42	58.3
Assault	04	5.6
Fall	14	19.4
Sport injury	12	16.7
Total	72	100
Type of fixation	Frequency	Percentage
With IMF	25	34.7
Without IMF	47	65.3
Total	72	100
Weight (kg)	Mean	Standard Deviation
Base line	70.08	11.14
After 4 weeks	68.00	10.90
Weight loss	2.07	0.94
Weight loss	Frequency	Percentage
Yes	23	31.9
No	49	68.1
Total	72	100

Table No. 3: Stratification of Weight Loss with Regards to Baseline Characteristics

Variable		Weight Loss		P Value
		Yes	No	
Age	Up to 35 Years (n=38)	08	30	0.036
	More than 35 Years (n=34)	15	19	
Gender	Male	18	40	0.736
	Female	05	09	
Residential Area	Rural (n=25)	12	13	0.033
	Urban (n=47)	11	36	
Etiology	RTA (n=42)	16	26	0.092
	Assault (n=04)	00	04	
	Fall (n=14)	06	08	
	Sport injury (n=12)	01	11	
Type of Fixation	With IMF (n=25)	10	15	0.285
	Without IMF (n=47)	13	34	

DISCUSSION

An average adult requires about 1800 to 2000 Cal/day. It has been shown that MMF results in weight loss and the body mass index (BMI). Due to the lack of nutritional intake the body muscles are catabolized for gluconeogenesis early during this phase and protein from the active tissues at the site of surgery[12]. Our study 80.6% (58 patients) were males, and 19.4% (14 patients) were females. Other studies have also shown the patients to be predominantly males. Our study also complies with a study by Mekkawy et al in Egypt which showed 80% male predominance[13]. Males are more prone to accidents as compared to females as the males work outside. Our findings are further supported by a study by Kayani et al[14] who found male predominance by 90%.

According to the results of our study 52.8 percent) of the patients (38 of the total patients were of age group 35 years. In a study in Egypt conducted by Mekkawy et al, in the patients of mean age 32.19 ± 11.85 years, same outcomes were reported that supported the findings of our study[13]. However in a report by Ogbezode et al, lower outcomes of mean age 27.7 ± 9.7 years were stated[1]. However, a different research found that the mean age of the participants was 34.0 ± 12.8 years, which is similar to the findings of our study. According to Kayani et al., 53.3% of the patients fell into the same age group as the results were obtained[14].

Out of total 72 cases, patients from rural areas were 34.7% (25 patients) and from urban areas were 65.3% (47 patients). Only 2.8% (2 patients) of the population was wealthy, while 75% (54 patients) had a moderate income and 22.2% (16 patients) had a poor socioeconomic level. Siddiqui et al. indicated that 91.3% of the participants were from urban regions, in contrast to Wahid et al. 85's findings that 59.3% of participants were from rural areas[15-16]. In accordance with findings of our study, Ye et al[17]. from China also found comparable findings, with 62.26% of patients coming from urban regions and 37.74% from rural regions[17]. Our study's findings are consistent with Siddiqui et al.'s claim of 21.9% of the population being poor, 75.4% having middle-class income, and 2.2% being rich[16].

In our study major causes of the mandibular fracture was road side accident (58.3%), followed by falling, sport injury, and physical attack were. Similar types of data were found by Rashid et al., with roadside accidents accounting for 59.4% and falls for 18.8%[18]. However, in the study done by Lee et al, the results were different results[19] while another study by Iqbal et al[20], found that trauma was most commonly caused by traffic accidents, accounting for 71.6% of cases, followed by falls for 20.7% and assaults for 5.6%.

Majority of the patients from our study were treated for mandibular fracture without IMF i.e. 65.3 % (47 patients out of 72) while remaining were treated with IMF. Also in agreement with our research results, Lone et al. reported mean base line weight of patients 68.87 ± 11.25 kg and after 5 weeks 65.25 ± 11.28 kg[12]. Similarly, Ruslin et al. reported that 30.87% of patients lost weight, and they did not find a significant

difference in weight reduction between patients with and without IMF[10].

CONCLUSION

High frequency of weight loss was noted in patients who were treated with or without intermaxillary fixation (IMF). Weight losses in our patients were significantly associated with increasing age. All clinicians treating such patients should anticipate weight loss for early diagnosis and timely management to improve quality of life of these patients.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Abubakar Saddique, Jehan Alam
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Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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