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TO EVALUATE THE SYNCOPE RISK IN A DENTAL CHAIR IN SUPINE POSITION DURING DIRECTION OF LOCAL ANESTHESIA: A PROSPECTIVE COMPARATIVE STUDY

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Abstract:
Objective: *This study was conducted to compare the incidence of syncope in supine versus semi-supine position during the administration of local anesthesia for dental surgery procedures among the local population.*
Place and Duration: *In the Department of Oral and Maxillofacial Surgery, Nishtar Institute of Dentistry, Multan for one-year duration from June 2019 to June 2020.*
Methods: *One thousand healthy patients who presented for tooth extraction were included in this study. The patients were divided into two groups. In Group A, the patients were administered a local anesthetic injection in the supine position, that is, with the patient's head and heart at the same level, while in Group B they were administered local anesthesia in the semi supine position.*
Results: *There were 1000 patients who required tooth extraction under local anesthesia with an age range of 15 to 47 years (mean 28.31 ± 8.55 years). It was observed that 135 patients (27%) treated in the supine position had symptoms of presyncope while 245 patients (49%) had symptoms of presyncope in the semi supine position. The difference was statistically significant (P <0.0001). No patient loses consciousness in the supine position in this study.*
Conclusion*: It was concluded that syncope was easy to prevent if all patients were placed supine beforehand.*
Key words: *Vasodepressor syncope, Dental chair position, Local anesthesia, Complications of local anesthesia.*

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INTRODUCTION:

Syncope is a transient and self-limited loss of consciousness and postural tone that usually leads to a fall due to transient cerebral hypoperfusion[1-2]. Syncope is the most common medical emergency, accounting for more than 60% of the emergencies that occur in a dental office. It occurs most frequently before, during or immediately after the administration of local anesthesia The predisposing factor for syncope can be psychogenic (fright, anxiety, emotional stress, bad news, sudden severe pain, sight of blood or surgical or dental instruments, for example, injection of local anesthetic) or non-psychogenic (standing or sitting for a long time in an upright position, for example, in a dental chair, skipped meals, hunger due to diet, exhaustion, poor physical condition, hot environment and wet, male, age 16 to 35[3-4]. The most important contributing factor in vasodepressor syncope is the position of the patient in a dental chair. Patients presenting for dental treatment are given local anesthesia in the supine or supine position[5-6]. semi-supine (30 to 45 degrees). Although syncope usually develops in the upright position, it can even occur in the supine position or in secluded positions in the dental chair. Syncope can be easily prevented by eliminating the predisposing factors, which is adequate room ventilation, room temperature control, light snack or meal before dental appointments, proper placement, and anxiety relief[7-8]. Additionally, leg crossing combined with muscle tension, applied as a simple physiological measure at the onset of prodromal symptoms, can delay or prevent vasovagal syncope. Today, all over the world, patients are treated in the supine or semi-supine position, a practice that has minimized the chances of syncope in the dental chair[9-10]. However, this is not always the case in this country, where most patients are still treated in an upright position. To our knowledge, there are no data on the incidence of chair syncope among patients presenting for treatment at various dental hospitals or dental clinics in Pakistan.

METHODOLOGY:

One thousand healthy patients who presented for tooth extraction at the Department of Oral and Maxillofacial Surgery were included in this convenient prospective sampling study design at Nishtar Institute of Dentistry, Multan for one-year duration from June 2019 to June 2020. This study was conducted with the prior approval of the ethics committee and the informed consent of all patients. After taking the medical history, patients with systemic diseases, such as hypertension, diabetes, heart problems, and pregnancy were excluded from the study. Each patient was asked to have a light snack or meal before the procedure in case they had an empty stomach. Types of clothing were observed, especially veil and ties. The anxiety levels of all patients were recorded preoperatively using a 10-point fear scale. A score of 1 indicates that there is no dental fear; 5 moderate fear; and 10 extreme fear. The patients were divided into two groups. Group A patients were given an injection of local anesthetic in the supine position, that is, with the patient's head and heart at the same level, while group B patients were given local anesthesia in a semi supine position (30o-40o position).

RESULTS:

There were 399 men (39.9%) and 601 women (60.1%). All the patients were healthy and their age ranged from 15 to 47 years, with a mean age of 28.32 ± 8.55 years (Table 1).

TABLE 1: DISTRIBUTION OF CASES ACCORDING TO AGE AND SEX

	Males n = 399		**Females n = 601**		**Total n = 1000**	
	No.	**Percent**	**No**	**Percent**	**No**	**Percent**
< 20	33	8.3	65	10.8	98	9.8
20 - 24	125	31.3	181	30.1	306	30.6
25 - 29	86	21.6	117	19.5	203	20.3
30 - 34	42	10.5	36	6.0	78	7.8
35 - 39	79	19.8	76	12.6	115	11.5
40 - 44	20	5.0	103	17.2	163	16.3
≥ 45	14	3.5	23	3.8	37	3.7
Mean ± SD	**28.21 ± 8.26**		**28.38 ± 8.73**		**28.31 ± 8.55**	

More than three-quarters of the patients (76.6%) had a score of 1 indicating that they were fearless on a 10-point fear scale, 20.2% had a score of 3-6 indicating fear mild to moderate, while 3.2% had a score of 7-10 indicates extreme fear (Fig. 1).

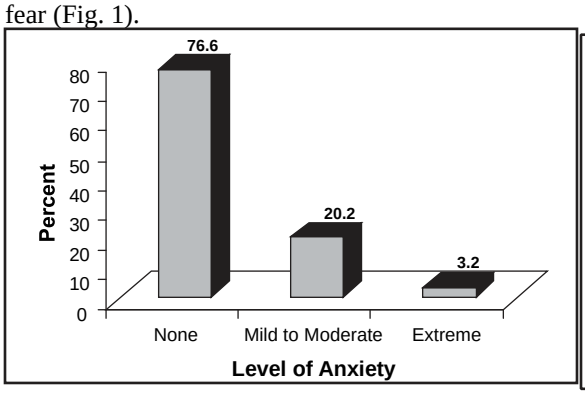

Fig 1: Level of Anxiety

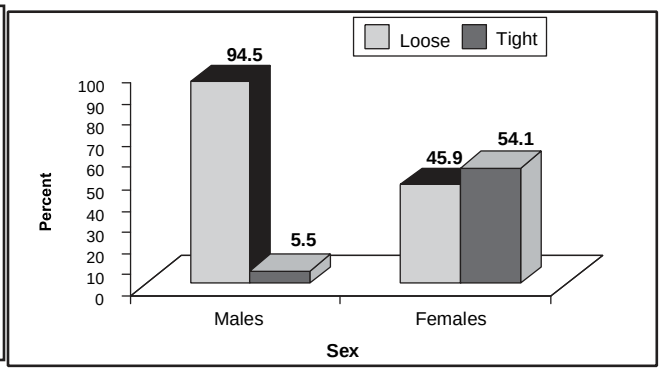

Fig 2: Type of clothing

Most of the patients (65.3%) wore loose fitting clothing, while 34.7% of the patients wore tight clothing that included a scarf, burqa or tie (Fig 2). Among the 500 patients included in group A, there were 189 men (37.8%) and 311 women (62.2%). These patients were administered local anesthesia in the supine position. Five hundred patients included in Group B had 210 men (42%) and 290 women (58%). Local anesthesia was administered in a semi-supine chair position (30o -45o). Group A 31.2% men and 24.4% women complained of mild lightheadedness, while in group B, 44.3% men and 52.4% women complained of symptoms (Table 2).

TABLE 2: COMPARISON OF SIGNS/SYMPTOMS OF SYNCOPE IN BOTH POSITIONS ACCORDING TO SEX

	Group A **Supine Position**		**Group B** **Semi-Supine Position**		
	No	**%**	**No**	**%**	
Males	189		210		
None	130	68.8	117	55.7	P = 0.022
Light Headedness	59	31.2	93	44.3	P = 0.009
Females	311		290		
None	235	75.6	138	47.6	P < 0.0001
Light Headedness	76	24.4	152	52.4	P < 0.0001

The frequency of presyncope between both sexes was significantly higher (P = 0.009 for men and P = 0.001 for women) in group B compared to group A (Table 2). All patients with symptoms of presyncope were immediately placed in the supine position except those who were already in the supine position and were kept that way, their clothing was loosened and they were asked to breathe deeply, practice crossing their legs and muscle tension while standing. they calmed until complete resolution of the symptoms. All patients fully recovered within 2-3 minutes. None of the patients lost consciousness once placed in the supine position.

DISCUSSION:

Syncope is a benign and self-limited process, which has a spontaneous recovery without therapeutic intervention. Loss of postural tone and definitive drooping is a natural protective mechanism that restores interrupted cerebral perfusion[11]. In the absence of this mechanism, death can eventually occur as seen in individuals who were forced to maintain an upright position during the crucifixion. Hass of the University of Toronto, Canada, has found that medical emergencies were more likely during and after local anesthesia, while a tooth extraction or root canal was being performed, and sixty percent of these emergencies were syncope, followed by hyperventilation (7 %). Studies from the United States and Canada have also shown that syncope is the most common medical emergency dentists see. Syncope accounted for approximately 50% of all emergencies reported during dental practice. Muller et al from Germany surveyed 2,998 dentists included in the Register of the Saxony State Dental Council in January 2005 to find out the most common medical emergencies in dental practice. Vasovagal syncope was the most frequent emergency (1238 cases)[12-13]. Girdler et al distributed a questionnaire to 887 dentists working in general dental practice in five counties in

Northern England. The most frequently reported emergency was vasovagal syncope (1.9 cases, per dentist per year), followed by hypoglycemia (0.17), angina (0.17), epileptic seizure (0.13), asphyxia (0, 09), asthma (0.06), hypertensive crisis (0.023).) and anaphylaxis (0.013). The most important contributing factor in vasodepressor syncope is the position of the patient in the dental chair. Patients presenting for dental treatment are given local anesthesia in the supine or semi-supine position (30 to 45 degrees). Although syncope usually develops in the upright position, it can even occur in the supine or sitting position on the dental chair. In our study, we found that 380 patients (38.0%) had symptoms of presyncope, including 228 women (22.8%) and 152 men (15.2%). A female patient is more susceptible to syncope than male patients. This finding contrasts with the widely held view that men experience syncope more often than women. This could be due to the fact that in our study the majority of 54.1% of the patients wore tight clothing, which is a risk factor for syncope[14]. Administration of the local anesthetic injection in the supine position minimizes the risk of syncope in the dental chair. When the patient is supine, the force of gravity is distributed equally throughout the body and blood flows more easily from the heart to the brain. In the semi-supine position, the systolic blood pressure decreases by 2 mmHg for every inch that the patient's head is located above the level of the heart. Graham et al found that 31.2% of 32 patients fainted while donating blood in the supine position, while 43.7% of 16 patients fainted while performing a simple venipuncture in the upright sitting position. We did not find any patient who had passed out in the supine position or after being placed in the supine position. The symptoms of presyncope in supine decubitus were 135 patients (27%) and in semi-supine 245 patients (49%). Gatchel et al. in the Division of Psychology at the University of Texas, Dallas evaluated the incidence of dental fear and avoidance in a general adult population[15]. They reported that 11.7% of the population had high dental fear and another 17.5% moderate dental fear, while the remaining 71% had no dental fear. Our study had comparable results, as 76.6% had no dental fear, 20.2% had mild to moderate fear, while 3.2% had extreme dental fear. Fear and anxiety are known predisposing psychological factors for syncope; however, we did not find any patient to have fainted after administration of local anesthetic in the supine position.

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