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Knowledge and Awareness about Barodontolgia among Undergraduate Dental Students

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Original Article

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ABSTRACT

Introduction: Dental pain caused by barometric pressure is a clinical condition provoked by pressure changes in the atmosphere. Barodontalgia (or aerodontalgia) in pilots is of significant concern since it can be a flight safety risk and impair the personnel's operational ability and performance. Because of its similar signs and symptoms, it can also go unnoticed and manifest itself during a pressure change which can be during flight ascend or descend.

Objective: To evaluate the presence of barodontalgia and knowledge of the phenomenon among Indian-based commercial pilots.

Materials and Methods: A cross-sectional study was carried out between June and August 2020 through a self-reported questionnaire submitted through Google Forms (Alphabet, Mountain View, CA, USA) among 410 Indian-based pilots. It included questions asking.

Regarding the incidence, localisation, severity, and frequency of in-flight dental pain. Inferential statistics were carried out using Chi-square test, One way analysis of variance (ANOVA), and Independent t-test. The statistical significance level was 0.05.

Results: 370 pilots filled out the questionnaire with a response rate of 90.24%. Incidence was seen in 10.54% (n=39) pilots despite 42.7% (n=158) being unaware of the same. Recurrence of pain was reported in only one case while none reported any threat to flight safety or accident, secondary to barodontalgia.

Conclusion: The level of incidence of barodontalgia in commercial pilots in India is low. Still, the unawareness remains a disquieting risk and was not found to be of any difference when compared on the grounds of gender and work experience.

Keywords: Aviation Dentistry, Barodontalgia, Diving Tooth Pain, In-flight Dental Pain, Odontocrexis.

Introduction

Aviation dentistry is the knowledge of the oral and dental health assessment, prevention, and management of diseases, conditions, or disorders of the oral and maxillofacial area and its related structures with its effect on aviators and aircrew members. Exposure to an environment of high altitude with abnormal changes in pressure gradient can affect the body's tissues. Conditions of the Oral and maxillofacial area like barotrauma, barodontalgia, and odontocrexis have been rather common since the early 20th century.

Barodontalgia is dental or non-dental pain caused by barometric pressure, elicited as a result of the failure of the pulp to acclimatize to this change with contributing factors like an infinitesimal void within a restored tooth or improper restorations of the tooth. Pain can also be triggered following a recent dental procedure and is termed as postoperative barodontalgia. The prevalence of in-flight pain has been recorded at altitudes of 2000 to 5000 ft (610 to 1524 m) but during the climbing phase, pain is due to conditions of pulp vitality, and necrotic pulpal diseases are seen during descending flight. Upper and lower first molars (30% of cases) are the most affected teeth. Barodontalgia ceases when the plane lands and descends to ground atmospheric level, but pain emanating as a result of intrinsic periradicular pathology or facial barotrauma can still persist.

The differential pressure is caused by a gas filled cavity within the human body since it cannot communicate with the outside environment in order to equalize it resulting in clinical pain, oedema, or vascular gas embolism and headache, numbness, or dental pain. Although the event of barodontalgia is rare it is a known latent risk among flyers resulting in mid-flight vertigo and unexpected disablement compromising aircrew safety. Barotrauma dental among flying crew can contribute to an uncomfortable flight experience through initiating fracture of dental restorations and even teeth.

Materials and Methods

This cross-sectional research study surveyed undergraduate dental students of tertiary care teaching hospital, Khammam. The research was approved by the Ethical Committee of the Faculty of the Department of Public Health Dentistry, Mamata Dental College.

Sample size calculation: The sample size was estimated as 300 by using G*Power data analysis employing formula (4pq/l2) where l is the acceptable error (5%), 'p' is the prevalence rate (20.6%) [12], and 'q' is (1-p).

Inclusion Criteria: 1st year, 2nd year, 3rd year, 4th year, Interns [students who are interested].
Exclusion Criteria: Post Graduates, faculty [students who are not interested].

Results

Q1

Gender				Q1				Total
				1	2	3	4	
1	Year of study	1	Count	4	5	5	1	15
			% of Total	4.6%	5.7%	5.7%	1.1%	17.2%
		2	Count	3	5	13	1	22
			% of Total	3.4%	5.7%	14.9%	1.1%	25.3%
		3	Count	6	10	5	1	22
			% of Total	6.9%	11.5%	5.7%	1.1%	25.3%
		4	Count	1	5	2	0	8
			% of Total	1.1%	5.7%	2.3%	0.0%	9.2%
		5	Count	8	9	3	0	20

			% of Total	9.2%	10.3%	3.4%	0.0%	23.0%
	Total		Count	22	34	28	3	87
			% of Total	25.3%	39.1%	32.2%	3.4%	100.0%
2	Year of study	1	Count	12	7	28	8	55
			% of Total	5.6%	3.3%	13.1%	3.8%	25.8%
		2	Count	6	9	30	5	50
			% of Total	2.8%	4.2%	14.1%	2.3%	23.5%
		3	Count	10	6	10	3	29
			% of Total	4.7%	2.8%	4.7%	1.4%	13.6%
		4	Count	3	3	17	14	37
			% of Total	1.4%	1.4%	8.0%	6.6%	17.4%
		5	Count	4	11	17	10	42
			% of Total	1.9%	5.2%	8.0%	4.7%	19.7%
	Total		Count	35	36	102	40	213
			% of Total	16.4%	16.9%	47.9%	18.8%	100.0%
Total	Year of study	1	Count	16	12	33	9	70
			% of Total	5.3%	4.0%	11.0%	3.0%	23.3%
		2	Count	9	14	43	6	72
			% of Total	3.0%	4.7%	14.3%	2.0%	24.0%
		3	Count	16	16	15	4	51
			% of Total	5.3%	5.3%	5.0%	1.3%	17.0%
		4	Count	4	8	19	14	45
			% of Total	1.3%	2.7%	6.3%	4.7%	15.0%
		5	Count	12	20	20	10	62
			% of Total	4.0%	6.7%	6.7%	3.3%	20.7%
	Total		Count	57	70	130	43	300
			% of Total	19.0%	23.3%	43.3%	14.3%	100.0%

P-value 0.204

Q2

Gender				Q2				Total
				1	2	3	4	
1	Year of study	1	Count	2	6	4	3	15
			% of Total	2.3%	6.9%	4.6%	3.4%	17.2%
		2	Count	6	7	3	6	22
			% of Total	6.9%	8.0%	3.4%	6.9%	25.3%
		3	Count	5	8	6	3	22
			% of Total	5.7%	9.2%	6.9%	3.4%	25.3%
		4	Count	1	5	2	0	8
			% of Total	1.1%	5.7%	2.3%	0.0%	9.2%
		5	Count	7	6	4	3	20
			% of Total	8.0%	6.9%	4.6%	3.4%	23.0%
	Total		Count	21	32	19	15	87

			% of Total	24.1%	36.8%	21.8%	17.2%	100.0%
2	Year of study	1	Count	8	24	9	14	55
			% of Total	3.8%	11.3%	4.2%	6.6%	25.8%
		2	Count	5	23	7	15	50
			% of Total	2.3%	10.8%	3.3%	7.0%	23.5%
		3	Count	5	16	5	3	29
			% of Total	2.3%	7.5%	2.3%	1.4%	13.6%
		4	Count	2	15	16	4	37
			% of Total	0.9%	7.0%	7.5%	1.9%	17.4%
		5	Count	4	24	9	5	42
			% of Total	1.9%	11.3%	4.2%	2.3%	19.7%
	Total		Count	24	102	46	41	213
			% of Total	11.3%	47.9%	21.6%	19.2%	100.0%
Total	Year of study	1	Count	10	30	13	17	70
			% of Total	3.3%	10.0%	4.3%	5.7%	23.3%
		2	Count	11	30	10	21	72
			% of Total	3.7%	10.0%	3.3%	7.0%	24.0%
		3	Count	10	24	11	6	51
			% of Total	3.3%	8.0%	3.7%	2.0%	17.0%
		4	Count	3	20	18	4	45
			% of Total	1.0%	6.7%	6.0%	1.3%	15.0%
		5	Count	11	30	13	8	62
			% of Total	3.7%	10.0%	4.3%	2.7%	20.7%
	Total		Count	45	134	65	56	300
			% of Total	15.0%	44.7%	21.7%	18.7%	100.0%

P-value 0.762

Q3

Gender				Q3				Total
				1	2	3	4	
1	Year of study	1	Count	1	4	7	3	15
			% of Total	1.1%	4.6%	8.0%	3.4%	17.2%
		2	Count	4	7	6	5	22
			% of Total	4.6%	8.0%	6.9%	5.7%	25.3%
		3	Count	3	6	10	3	22
			% of Total	3.4%	6.9%	11.5%	3.4%	25.3%
		4	Count	0	2	3	3	8
			% of Total	0.0%	2.3%	3.4%	3.4%	9.2%
		5	Count	7	6	6	1	20
			% of Total	8.0%	6.9%	6.9%	1.1%	23.0%
	Total		Count	15	25	32	15	87
			% of Total	17.2%	28.7%	36.8%	17.2%	100.0%
2	Year of study	1	Count	12	8	22	13	55

			% of Total	5.6%	3.8%	10.3%	6.1%	25.8%
		2	Count	18	12	12	8	50
			% of Total	8.5%	5.6%	5.6%	3.8%	23.5%
		3	Count	15	8	6	0	29
			% of Total	7.0%	3.8%	2.8%	0.0%	13.6%
		4	Count	3	12	17	5	37
			% of Total	1.4%	5.6%	8.0%	2.3%	17.4%
		5	Count	17	11	9	5	42
			% of Total	8.0%	5.2%	4.2%	2.3%	19.7%
	Total		Count	65	51	66	31	213
			% of Total	30.5%	23.9%	31.0%	14.6%	100.0%
Total	Year of study	1	Count	13	12	29	16	70
			% of Total	4.3%	4.0%	9.7%	5.3%	23.3%
		2	Count	22	19	18	13	72
			% of Total	7.3%	6.3%	6.0%	4.3%	24.0%
		3	Count	18	14	16	3	51
			% of Total	6.0%	4.7%	5.3%	1.0%	17.0%
		4	Count	3	14	20	8	45
			% of Total	1.0%	4.7%	6.7%	2.7%	15.0%
		5	Count	24	17	15	6	62
			% of Total	8.0%	5.7%	5.0%	2.0%	20.7%
	Total		Count	80	76	98	46	300
			% of Total	26.7%	25.3%	32.7%	15.3%	100.0%

P-value 0.426

Q4

Crosstab								
Gender				Q4				Total
				1	2	3	4	
1	Year of study	1	Count	2	3	7	3	15
			% of Total	2.3%	3.4%	8.0%	3.4%	17.2%
		2	Count	2	6	5	9	22
			% of Total	2.3%	6.9%	5.7%	10.3%	25.3%
		3	Count	4	6	9	3	22
			% of Total	4.6%	6.9%	10.3%	3.4%	25.3%
		4	Count	1	3	4	0	8
			% of Total	1.1%	3.4%	4.6%	0.0%	9.2%
		5	Count	5	6	6	3	20
			% of Total	5.7%	6.9%	6.9%	3.4%	23.0%
	Total		Count	14	24	31	18	87
			% of Total	16.1%	27.6%	35.6%	20.7%	100.0%
2	Year of study	1	Count	7	14	22	12	55
			% of Total	3.3%	6.6%	10.3%	5.6%	25.8%

		2	Count	4	16	9	21	50
			% of Total	1.9%	7.5%	4.2%	9.9%	23.5%
		3	Count	9	8	9	3	29
			% of Total	4.2%	3.8%	4.2%	1.4%	13.6%
		4	Count	1	9	21	6	37
			% of Total	0.5%	4.2%	9.9%	2.8%	17.4%
		5	Count	6	16	10	10	42
			% of Total	2.8%	7.5%	4.7%	4.7%	19.7%
	Total		Count	27	63	71	52	213
			% of Total	12.7%	29.6%	33.3%	24.4%	100.0%
Total	Year of study	1	Count	9	17	29	15	70
			% of Total	3.0%	5.7%	9.7%	5.0%	23.3%
		2	Count	6	22	14	30	72
			% of Total	2.0%	7.3%	4.7%	10.0%	24.0%
		3	Count	13	14	18	6	51
			% of Total	4.3%	4.7%	6.0%	2.0%	17.0%
		4	Count	2	12	25	6	45
			% of Total	0.7%	4.0%	8.3%	2.0%	15.0%
		5	Count	11	22	16	13	62
			% of Total	3.7%	7.3%	5.3%	4.3%	20.7%
	Total		Count	41	87	102	70	300
			% of Total	13.7%	29.0%	34.0%	23.3%	100.0%

P-value 0.470

Q5

Gender				Q5				Total
				1	2	3	4	
1	Year of study	1	Count	5	3	3	4	15
			% of Total	5.7%	3.4%	3.4%	4.6%	17.2%
		2	Count	5	5	1	11	22
			% of Total	5.7%	5.7%	1.1%	12.6%	25.3%
		3	Count	8	5	4	5	22
			% of Total	9.2%	5.7%	4.6%	5.7%	25.3%
		4	Count	2	1	1	4	8
			% of Total	2.3%	1.1%	1.1%	4.6%	9.2%
		5	Count	7	8	2	3	20
			% of Total	8.0%	9.2%	2.3%	3.4%	23.0%
	Total		Count	27	22	11	27	87
			% of Total	31.0%	25.3%	12.6%	31.0%	100.0%
2	Year of study	1	Count	11	9	5	30	55
			% of Total	5.2%	4.2%	2.3%	14.1%	25.8%
		2	Count	11	13	4	22	50
			% of Total	5.2%	6.1%	1.9%	10.3%	23.5%

		3	Count	6	8	5	10	29
			% of Total	2.8%	3.8%	2.3%	4.7%	13.6%
		4	Count	4	5	16	12	37
			% of Total	1.9%	2.3%	7.5%	5.6%	17.4%
		5	Count	9	8	8	17	42
			% of Total	4.2%	3.8%	3.8%	8.0%	19.7%
	Total		Count	41	43	38	91	213
			% of Total	19.2%	20.2%	17.8%	42.7%	100.0%
Total	Year of study	1	Count	16	12	8	34	70
			% of Total	5.3%	4.0%	2.7%	11.3%	23.3%
		2	Count	16	18	5	33	72
			% of Total	5.3%	6.0%	1.7%	11.0%	24.0%
		3	Count	14	13	9	15	51
			% of Total	4.7%	4.3%	3.0%	5.0%	17.0%
		4	Count	6	6	17	16	45
			% of Total	2.0%	2.0%	5.7%	5.3%	15.0%
		5	Count	16	16	10	20	62
			% of Total	5.3%	5.3%	3.3%	6.7%	20.7%
	Total		Count	68	65	49	118	300
			% of Total	22.7%	21.7%	16.3%	39.3%	100.0%

P-value 0.481

Q6

Gender				Q6					Total
				1	2	3	4	11	
1	Year of study	1	Count	2	1	2	10		15
			% of Total	2.3%	1.1%	2.3%	11.5%		17.2%
		2	Count	6	4	0	12		22
			% of Total	6.9%	4.6%	0.0%	13.8%		25.3%
		3	Count	2	2	3	15		22
			% of Total	2.3%	2.3%	3.4%	17.2%		25.3%
		4	Count	0	1	2	5		8
			% of Total	0.0%	1.1%	2.3%	5.7%		9.2%
		5	Count	7	2	2	9		20
			% of Total	8.0%	2.3%	2.3%	10.3%		23.0%
	Total		Count	17	10	9	51		87
			% of Total	19.5%	11.5%	10.3%	58.6%		100.0%
2	Year of study	1	Count	4	9	8	33	1	55
			% of Total	1.9%	4.2%	3.8%	15.5%	0.5%	25.8%
		2	Count	12	3	5	30	0	50
			% of Total	5.6%	1.4%	2.3%	14.1%	0.0%	23.5%
		3	Count	4	5	4	15	1	29
			% of Total	1.9%	2.3%	1.9%	7.0%	0.5%	13.6%

		4	Count	3	1	1	32	0	37
			% of Total	1.4%	0.5%	0.5%	15.0%	0.0%	17.4%
		5	Count	6	8	2	26	0	42
			% of Total	2.8%	3.8%	0.9%	12.2%	0.0%	19.7%
	Total		Count	29	26	20	136	2	213
			% of Total	13.6%	12.2%	9.4%	63.8%	0.9%	100.0%
Total	Year of study	1	Count	6	10	10	43	1	70
			% of Total	2.0%	3.3%	3.3%	14.3%	0.3%	23.3%
		2	Count	18	7	5	42	0	72
			% of Total	6.0%	2.3%	1.7%	14.0%	0.0%	24.0%
		3	Count	6	7	7	30	1	51
			% of Total	2.0%	2.3%	2.3%	10.0%	0.3%	17.0%
		4	Count	3	2	3	37	0	45
			% of Total	1.0%	0.7%	1.0%	12.3%	0.0%	15.0%
		5	Count	13	10	4	35	0	62
			% of Total	4.3%	3.3%	1.3%	11.7%	0.0%	20.7%
	Total		Count	46	36	29	187	2	300
			% of Total	15.3%	12.0%	9.7%	62.3%	0.7%	100.0%

P-value 0.366

Q7

Gender				Q7		Total
				1	2	
1	Year of study	1	Count	7	8	15
			% of Total	8.0%	9.2%	17.2%
		2	Count	11	11	22
			% of Total	12.6%	12.6%	25.3%
		3	Count	11	11	22
			% of Total	12.6%	12.6%	25.3%
		4	Count	1	7	8
			% of Total	1.1%	8.0%	9.2%
		5	Count	7	13	20
			% of Total	8.0%	14.9%	23.0%
	Total		Count	37	50	87
			% of Total	42.5%	57.5%	100.0%
2	Year of study	1	Count	23	32	55
			% of Total	10.8%	15.0%	25.8%
		2	Count	14	36	50
			% of Total	6.6%	16.9%	23.5%
		3	Count	6	23	29
			% of Total	2.8%	10.8%	13.6%
		4	Count	3	34	37
			% of Total	1.4%	16.0%	17.4%

		5	Count	8	34	42
			% of Total	3.8%	16.0%	19.7%
	Total		Count	54	159	213
			% of Total	25.4%	74.6%	100.0%
Total	Year of study	1	Count	30	40	70
			% of Total	10.0%	13.3%	23.3%
		2	Count	25	47	72
			% of Total	8.3%	15.7%	24.0%
		3	Count	17	34	51
			% of Total	5.7%	11.3%	17.0%
		4	Count	4	41	45
			% of Total	1.3%	13.7%	15.0%
		5	Count	15	47	62
			% of Total	5.0%	15.7%	20.7%
	Total		Count	91	209	300
			% of Total	30.3%	69.7%	100.0%

P-value 0.340

Q8

Gender				Q8		Total
				1	2	
1	Year of study	1	Count	8	7	15
			% of Total	9.2%	8.0%	17.2%
		2	Count	14	8	22
			% of Total	16.1%	9.2%	25.3%
		3	Count	13	9	22
			% of Total	14.9%	10.3%	25.3%
		4	Count	3	5	8
			% of Total	3.4%	5.7%	9.2%
		5	Count	11	9	20
			% of Total	12.6%	10.3%	23.0%
	Total		Count	49	38	87
			% of Total	56.3%	43.7%	100.0%
2	Year of study	1	Count	24	31	55
			% of Total	11.3%	14.6%	25.8%
		2	Count	27	23	50
			% of Total	12.7%	10.8%	23.5%
		3	Count	12	17	29
			% of Total	5.6%	8.0%	13.6%
		4	Count	4	33	37
			% of Total	1.9%	15.5%	17.4%
		5	Count	12	30	42
			% of Total	5.6%	14.1%	19.7%

	Total		Count	79	134	213
			% of Total	37.1%	62.9%	100.0%
Total	Year of study	1	Count	32	38	70
			% of Total	10.7%	12.7%	23.3%
		2	Count	41	31	72
			% of Total	13.7%	10.3%	24.0%
		3	Count	25	26	51
			% of Total	8.3%	8.7%	17.0%
		4	Count	7	38	45
			% of Total	2.3%	12.7%	15.0%
		5	Count	23	39	62
			% of Total	7.7%	13.0%	20.7%
	Total		Count	128	172	300
			% of Total	42.7%	57.3%	100.0%

P-value 0.778

Q9

Gender				Q9				Total
				1	2	3	4	
1	Year of study	1	Count	2	3	3	7	15
			% of Total	2.3%	3.4%	3.4%	8.0%	17.2%
		2	Count	1	5	2	14	22
			% of Total	1.1%	5.7%	2.3%	16.1%	25.3%
		3	Count	3	5	2	12	22
			% of Total	3.4%	5.7%	2.3%	13.8%	25.3%
		4	Count	2	0	4	2	8
			% of Total	2.3%	0.0%	4.6%	2.3%	9.2%
		5	Count	4	4	1	11	20
			% of Total	4.6%	4.6%	1.1%	12.6%	23.0%
	Total		Count	12	17	12	46	87
			% of Total	13.8%	19.5%	13.8%	52.9%	100.0%
2	Year of study	1	Count	5	12	10	28	55
			% of Total	2.3%	5.6%	4.7%	13.1%	25.8%
		2	Count	1	7	12	30	50
			% of Total	0.5%	3.3%	5.6%	14.1%	23.5%
		3	Count	4	7	6	12	29
			% of Total	1.9%	3.3%	2.8%	5.6%	13.6%
		4	Count	1	6	12	18	37
			% of Total	0.5%	2.8%	5.6%	8.5%	17.4%
		5	Count	2	6	15	19	42
			% of Total	0.9%	2.8%	7.0%	8.9%	19.7%
	Total		Count	13	38	55	107	213
			% of Total	6.1%	17.8%	25.8%	50.2%	100.0%

Total	Year of study	1	Count	7	15	13	35	70
			% of Total	2.3%	5.0%	4.3%	11.7%	23.3%
		2	Count	2	12	14	44	72
			% of Total	0.7%	4.0%	4.7%	14.7%	24.0%
		3	Count	7	12	8	24	51
			% of Total	2.3%	4.0%	2.7%	8.0%	17.0%
		4	Count	3	6	16	20	45
			% of Total	1.0%	2.0%	5.3%	6.7%	15.0%
		5	Count	6	10	16	30	62
			% of Total	2.0%	3.3%	5.3%	10.0%	20.7%
	Total		Count	25	55	67	153	300
			% of Total	8.3%	18.3%	22.3%	51.0%	100.0%

P-value 0.187

Q10

Gender				Q10				Total
				1	2	3	4	
1	Year of study	1	Count	1	6	3	5	15
			% of Total	1.1%	6.9%	3.4%	5.7%	17.2%
		2	Count	0	5	6	11	22
			% of Total	0.0%	5.7%	6.9%	12.6%	25.3%
		3	Count	2	8	6	6	22
			% of Total	2.3%	9.2%	6.9%	6.9%	25.3%
		4	Count	0	1	5	2	8
			% of Total	0.0%	1.1%	5.7%	2.3%	9.2%
		5	Count	5	7	2	6	20
			% of Total	5.7%	8.0%	2.3%	6.9%	23.0%
	Total		Count	8	27	22	30	87
			% of Total	9.2%	31.0%	25.3%	34.5%	100.0%
2	Year of study	1	Count	8	12	9	26	55
			% of Total	3.8%	5.6%	4.2%	12.2%	25.8%
		2	Count	5	10	6	29	50
			% of Total	2.3%	4.7%	2.8%	13.6%	23.5%
		3	Count	5	8	5	11	29
			% of Total	2.3%	3.8%	2.3%	5.2%	13.6%
		4	Count	2	7	14	14	37
			% of Total	0.9%	3.3%	6.6%	6.6%	17.4%
		5	Count	2	9	10	21	42
			% of Total	0.9%	4.2%	4.7%	9.9%	19.7%
	Total		Count	22	46	44	101	213
			% of Total	10.3%	21.6%	20.7%	47.4%	100.0%
Total	Year of study	1	Count	9	18	12	31	70
			% of Total	3.0%	6.0%	4.0%	10.3%	23.3%

		2	Count	5	15	12	40	72
			% of Total	1.7%	5.0%	4.0%	13.3%	24.0%
		3	Count	7	16	11	17	51
			% of Total	2.3%	5.3%	3.7%	5.7%	17.0%
		4	Count	2	8	19	16	45
			% of Total	0.7%	2.7%	6.3%	5.3%	15.0%
		5	Count	7	16	12	27	62
			% of Total	2.3%	5.3%	4.0%	9.0%	20.7%
	Total		Count	30	73	66	131	300
			% of Total	10.0%	24.3%	22.0%	43.7%	100.0%

P-value 0.088

Q11

Gender				Q11				Total
				1	2	3	4	
1	Year of study	1	Count	2	7	4	2	15
			% of Total	2.3%	8.0%	4.6%	2.3%	17.2%
		2	Count	7	7	3	5	22
			% of Total	8.0%	8.0%	3.4%	5.7%	25.3%
		3	Count	4	5	7	6	22
			% of Total	4.6%	5.7%	8.0%	6.9%	25.3%
		4	Count	0	2	4	2	8
			% of Total	0.0%	2.3%	4.6%	2.3%	9.2%
		5	Count	8	5	4	3	20
			% of Total	9.2%	5.7%	4.6%	3.4%	23.0%
	Total		Count	21	26	22	18	87
			% of Total	24.1%	29.9%	25.3%	20.7%	100.0%
2	Year of study	1	Count	12	21	10	12	55
			% of Total	5.6%	9.9%	4.7%	5.6%	25.8%
		2	Count	19	22	4	5	50
			% of Total	8.9%	10.3%	1.9%	2.3%	23.5%
		3	Count	8	10	5	6	29
			% of Total	3.8%	4.7%	2.3%	2.8%	13.6%
		4	Count	5	5	10	17	37
			% of Total	2.3%	2.3%	4.7%	8.0%	17.4%
		5	Count	7	19	4	12	42
			% of Total	3.3%	8.9%	1.9%	5.6%	19.7%
	Total		Count	51	77	33	52	213
			% of Total	23.9%	36.2%	15.5%	24.4%	100.0%
Total	Year of study	1	Count	14	28	14	14	70
			% of Total	4.7%	9.3%	4.7%	4.7%	23.3%
		2	Count	26	29	7	10	72
			% of Total	8.7%	9.7%	2.3%	3.3%	24.0%

		3	Count	12	15	12	12	51
			% of Total	4.0%	5.0%	4.0%	4.0%	17.0%
		4	Count	5	7	14	19	45
			% of Total	1.7%	2.3%	4.7%	6.3%	15.0%
		5	Count	15	24	8	15	62
			% of Total	5.0%	8.0%	2.7%	5.0%	20.7%
	Total		Count	72	103	55	70	300
			% of Total	24.0%	34.3%	18.3%	23.3%	100.0%

P-value 0.396

Q12

Gender				Q12		Total
				1	2	
1	Year of study	1	Count	9	6	15
			% of Total	10.3%	6.9%	17.2%
		2	Count	18	4	22
			% of Total	20.7%	4.6%	25.3%
		3	Count	11	11	22
			% of Total	12.6%	12.6%	25.3%
		4	Count	1	7	8
			% of Total	1.1%	8.0%	9.2%
		5	Count	10	10	20
			% of Total	11.5%	11.5%	23.0%
	Total		Count	49	38	87
			% of Total	56.3%	43.7%	100.0%
2	Year of study	1	Count	38	17	55
			% of Total	17.8%	8.0%	25.8%
		2	Count	38	12	50
			% of Total	17.8%	5.6%	23.5%
		3	Count	14	15	29
			% of Total	6.6%	7.0%	13.6%
		4	Count	6	31	37
			% of Total	2.8%	14.6%	17.4%
		5	Count	25	17	42
			% of Total	11.7%	8.0%	19.7%
	Total		Count	121	92	213
			% of Total	56.8%	43.2%	100.0%
Total	Year of study	1	Count	47	23	70
			% of Total	15.7%	7.7%	23.3%
		2	Count	56	16	72
			% of Total	18.7%	5.3%	24.0%
		3	Count	25	26	51
			% of Total	8.3%	8.7%	17.0%

		4	Count	7	38	45
			% of Total	2.3%	12.7%	15.0%
		5	Count	35	27	62
			% of Total	11.7%	9.0%	20.7%
	Total		Count	170	130	300
			% of Total	56.7%	43.3%	100.0%

P-value 0.012

Discussion

Dental surgeons have concluded barodontalgia as an emergency. In the current study, 10.54% (n=39) commercial Indian pilots from government and private sectors of India have complained that they have suffered in-flight dental pain compared to 20.6% Indian origin pilots who complained in 2010. With the same study design after 10 years the current study finds that the incidence of barodontalgia has been decreased. This reduction in barodontalgia can presumably be explained by improved oral hygiene care as a result of frequent dental examination. In this regard, findings from this study indicate that 45.4% (n=168) of pilots attend their dentist for routine dental check-ups. Additionally, enhanced technology ensuring cabin differential pressure also plays a role in reducing the incidence of barodontalgia. The present prevalence of barodontalgia in Indian-based pilots is lesser than those of commercial airlines of Pakistan (29.03%) but more than that of commercial French pilots (6.5%). Barodontalgic pain has been reported by Kuwait and Saudi military pilots and Turkish Air Force pilots with an incidence of 49.6% and 12%, respectively. On the other hand, Israeli Air Force has reported a prevalence of 8.2% in 2007 and 0.26% frequency was reported in the German Air Force Crew by Kollmann W. But Pakistani military pilots have reported 0% of barodontalgia. This difference can be attributed to the variation in study design, study sample and cultural and ethnic backgrounds. The opposite difference between commercial and military equivalents lies in the assumption that military pilots are more prone to being exposed to extreme conditions.

In the current study, information about in-flight pain and its features was collected. No one from the study participants complained about presence of pain before the flight. Ritchey B and Orban B, advocated greater frequency of barodontalgia caused by rapid ascent, this is in accordance with the current study where 46.2% pilots (n=18) experienced pain during flight ascent. The increased incidences noted on ascent accounts for the fact that pain was related to the underlying vital pulp pathology and therefore 11.4% (n=4) and 68.6% (n=24) study subjects reported that they were given restoration and root canal treatment, respectively with a probable diagnosis of acute pulpitis, caries or defective restorations. No relation between intensity of pain felt by the pilots and gender was observed based on available evidences. The average in-flight pain for the male pilots was 5.3 and for the female pilots was 5.5. In Kollmann's series of high altitude chamber simulations, 29% of cases were attributed to exposed vital pulp and 14% to pulpitis or periapical periodontitis. Most frequent incidental cause of barodontalgia was deep caries without pulp exposure in Kollmann's series similarly in 11.4% (n=4) of subjects participating in current study, restoration of offending tooth was carried out, root canal treatment was given to 68.6% (n=24) of the pilots with in-flight pain while 10.6% (n=7) received extraction.

Conclusion

It can be seen from the data provided that barodontalgia incidence was only 10.54% of the sample size which is comparatively low compared to other nations' reports. It proved to be of minor type and did not disturb the pilot's health as well as the routine of the flight. Still, dental barotrauma

continues to be a cause of concern for aviators, and its perception among dental surgeons and pilots have been revealed to be low.

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