Journal of Cardiovascular Disease Research

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 04, 2024

Original research article

EFFECT OF PREOPERATIVE ANXIETY ON HAEMODYNAMIC PARAMETERS DURING INDUCTION OF ANAESTHESIA

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Abstract

Aim: To evaluate how preoperative anxiety affects hemodynamic parameters in patients who were undergoing surgery and to evaluate for the rise in blood pressure and heart rate in patients with higher preoperative anxiety.

Methodology: 60 patients were observed for the hemodynamic changes due to anxiety in preoperative period, before induction and after induction. The anxiety scores were analysed and tabulated.

Result: Preoperative anxiety has a significant impact on heart rate, systolic blood pressure, diastolic blood pressure and SpO_2 of the study participants.

Conclusion: During pre-operative period there is no impact of anxiety on hemodynamic parameters. But before induction there was significant impact of anxiety on heart rate, systolic blood pressure, diastolic blood pressure and SpO_2.

Keywords: Preoperative anxiety, hemodynamic parameters, systolic blood pressure, diastolic blood pressure, general anaesthesia

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Introduction

Anxiety is a feeling of unease that is accompanied by aberrant hemodynamic indicators as a result of sympathetic, parasympathetic, and endocrine stimulation. It starts as soon as the surgery is scheduled and peaks at the time of admission to the hospital [1]. Preoperative anxiety has long been recognized as a serious problem among surgical patients. Excessive anxiety causes negative psychological and bodily stress responses. It leads to a higher anaesthetic drug usage.

Preoperative anxiety is a widespread issue that has piqued researchers' curiosity for decades. An increase in autonomic fluctuations and the need for anaesthesia, as well as an increased incidence of nausea and vomiting, and higher pain throughout the postoperative period, have all been linked to perioperative anxiety Furthermore; preoperative anxiety has an impact on recovery and postoperative pain [2-3].

The risk of difficulties during anaesthesia and after complications is reduced when the patient is mentally properly prepared. The scope of the pre-surgical examination and diagnostic testing is defined by the type of operation, the patient's medical state, and the surgery's urgency [4]. The outcome of treatment in patients is influenced by preoperative anxiety. The Amsterdam Preoperative Anxiety and Information Scale (APAIS) were created to assess preoperative anxiety. The APAIS uses six items to assess anxiety and the need for information. It has a high level of reliability and validity [5].

Despite the fact that the detrimental effects of preoperative anxiety are well documented, very few studies on the relationship between preoperative anxiety and hemodynamic alterations during anaesthetic induction have been done yet. This study aimed to evaluate preoperative anxiety affected hemodynamic parameters in individuals undergoing elective surgery which measuredly included rise in blood pressure and heart rate in participants with greater preoperative anxiety.

Materials and Methods

After obtaining the ethical clearance from institutional review board and written consent from patients were taken before including in the trial, 60 patients aged between 20-59 years were enrolled in the study based on inclusion and exclusion criteria.

Inclusion criteria

- Patients undergoing General Anaesthesia.
- Patients with American Society of Anaesthesiologists (ASA) grade I, II.

Exclusion criteria

- Patients with ASA grade III and IV.
- Paediatric and pregnant patient.
- Mentally retarded patient.

In the pre-operative room, the patients were asked to fill out The Amsterdam Preoperative Anxiety and Information Scale (APAIS) questionnaires. Heart rate and blood pressure were examined. Simple random sampling was done. Patients were subjected thorough history, clinical examination, biochemical investigations, and detailed pre-anaesthetic assessment.

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 04, 2024

Patients were informed about their right to refuse or discontinue their participation in the study. Anxiety was monitored by using (APAIS). Answers to the statements was evaluated with Likert Scale.

Statistical analysis

The data from all the tests were collected and subjected to statistical analysis. The results obtained from the study were compared using Repeated Measures ANOVA and One Way ANOVA using SPSS version 26 (IBM SPSS statistics Inc., Chicago, Illinois, USA).

Results

Table 1: Distribution of Socio demographic variable Age (in Years)

Min-Max (Median)	19-59(37.00)
Mean ± SD	37.68 ± 10.59
Weight	
Min-Max (Median)	36-87(67.25)
Mean ± SD	67.54 ± 10.99
Gender n(%)	
Female	35(58.3%)
Male	25(41.7%)
ASA n (%)	
I	23(38.3%)
II	37(61.7%)

In the present study, table 1 shows the demographic distribution of the data in which the mean ages of the study participants were 37.68 years and having standard deviation 10.59 years. According to the weight of the study participants, the minimum weight was found to be 36 kgs and 87kgs was maximum having their mean weight around 67.54 kgs with 10.99kgs standard deviation. Similarly for gender distribution female participation was dominant in this study, almost 58% were females and 42% are males.

Table 2: Association of anxiety score and Heart rate by different duration

Heart Rate	Pre	Before Induction	After Induction
None	87.65± 9.79	82.65 ± 7.63	78.95 ± 4.81
Slightly	85.92± 9.62	90.53 ± 9.51	80.92± 6.90
Moderately	90.0 ± 12.29	88.67 ± 6.81	79.67 ± 6.03
R-Value	-0.043	0.307	0.089
P-Value	0.686	**0.004**	0.413

According to table no 2, it shows the association of anxiety score with heart rate of the patients, the mean value of pre-test analysis of anxiety score with the heart rate, the mean value was 87.65 having no anxiety, those patients having 85.92 heart rate was

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 04, 2024

having slight anxiety problem and those patients having 90 heart rate having moderate anxiety, spearman correlation coefficient test was used and the results was not significant at 0.05 level of significance.

Similarly, for before induction there were positive association between anxiety and heart rate of the study participants and the results was significant at p = 0.05 level of significance.

According to after induction, there is slightly a very weak correlation and the results were not significant.

Association of anxiety score and Heart rate by different duration:

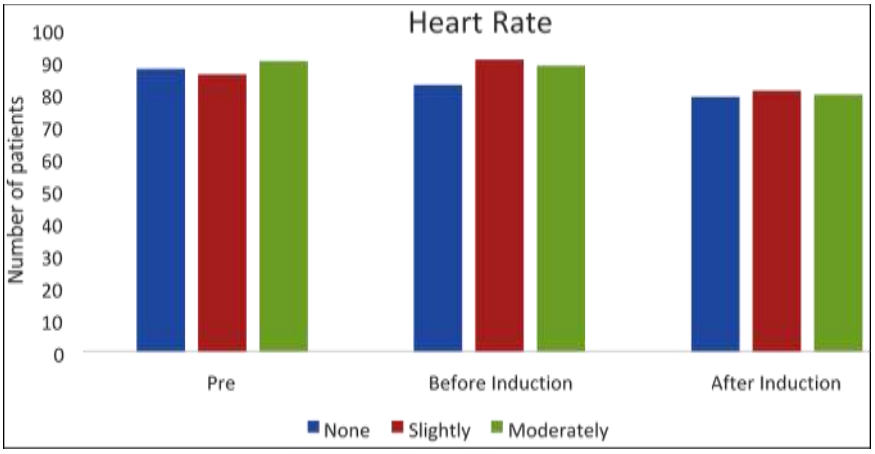

Table 3: Association of anxiety score and SBP by different duration

SBP	Pre	Before Induction	After Induction
None	121.35 ± 9.09	120.17 ± 6.92	114.65 ± 5.15
Slightly	123.53 ± 11.96	126.44 ± 12.12	118.56± 8.76
Moderately	137.33 ± 8.02	136.33 ± 10.02	123.0 ± 9.54
R-value	0.185	0.352	0.238
P-value	0.085	**0.001**	**0.026**

According to table 3, it describes the association of anxiety score with systolic blood pressure of the patients, the mean value of pre-test analysis of anxiety score with the SBP, the mean value was 121.35 having no anxiety, those patients having 123.53 SBP was having slight anxiety problem and those patients having 137.33 SBP having moderate anxiety, spearman correlation coefficient test was used and the results was not significant at 0.05 level of significance.

Similarly, before induction there was positive association between anxiety and systolic blood pressure of the study participants and the results was significant at 0.05 level of significance.

According to after induction, there is slightly weak correlation and the results were significant at less than 0.05 level of significance.

Association of anxiety score and SBP by different duration:

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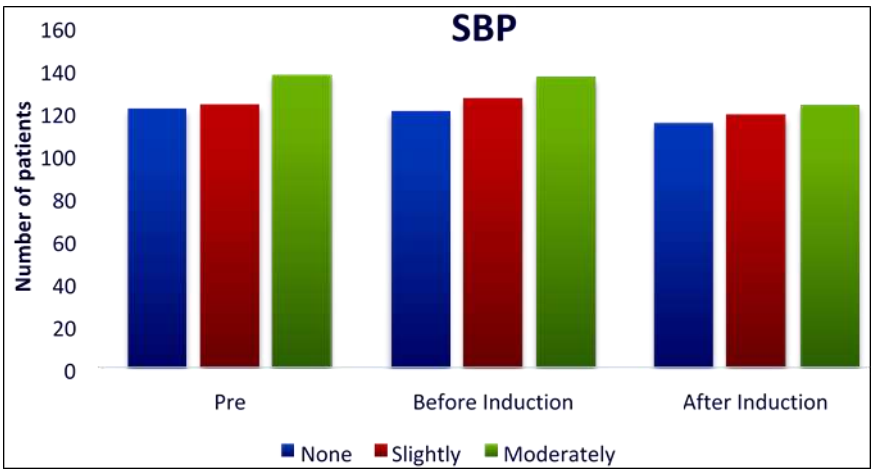

Table 4: Association of anxiety score and DBP by different duration

DBP	Pre	Before Induction	After Induction
None	77.56 ± 6.32	82.12 ± 8.78	81.04 ± 9.48
Slightly	77.75 ± 6.25	82.10 ± 8.84	81.03 ± 9.56
Moderately	76.53 ± 5.84	82.47 ± 9.30	82.16 ± 8.44
R-value	0.048	0.419	0.422
P-value	0.716NS	**0.001***	**0.001***

In the present study, table 4 describes the association of anxiety score with diastolic blood pressure of the patients, the mean value of pre-test analysis of anxiety score with the DBP, the mean value was 77.56 having no anxiety, those patients having 77.75 DBP was slightly anxiety problem and those patients having 76.53 DBP having moderately problem, spearman correlation coefficient test was used and the results was not significant at 0.05 level of significance.

Similarly, for before induction there were very weak positive association between anxiety and diastolic blood pressure of the study participants and the results was significant at 0.05 level of significance.

According to after induction, there is slightly weak correlation and the results were significant at 0.05 level of significance.

Association of anxiety score and SBP by different duration:

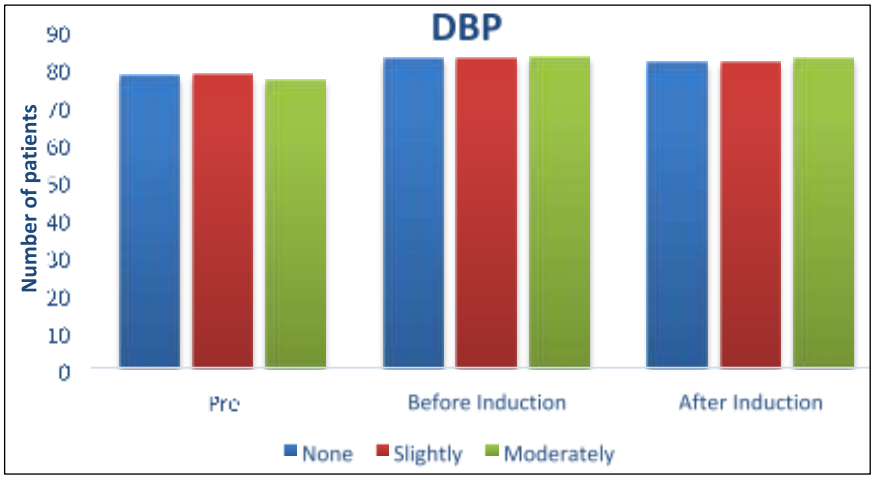

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Table 5: Association of anxiety score and SPO_2 by different duration

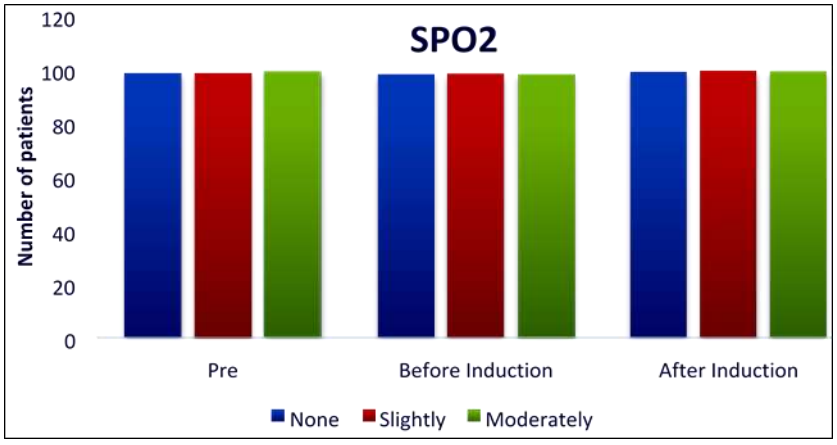
SPO_2	Pre	Before Induction	After Induction
None	98.70 ± 1.02	98.17 ± 1.07	99.04 ± 2.90
Slightly	98.76± 1.23	98.44 ± 1.02	99.50± 0.90
Moderately	99.33 ± 1.15	98.33 ± 1.53	99.33 ± 0.58
R-value	0.102	0.061	-0.097
P-value	0.380	0.605	0.435

According to table 5, it shows the association of anxiety score with SPO_2 of the patients, the mean value of pre-test analysis of anxiety score with the SPO_2, the mean value was 98.70 having no anxiety, those patients having 98.76 SPO_2 was having slight anxiety problem and those patients having 99.33 SPO_2 having moderate problem, spearman correlation coefficient test was used and the results was not significant at 0.05 level of significance.

Similarly, for before induction there were positive association between anxiety and systolic blood pressure of the study participants and the results was significant at 0.05 level of significance.

According to after induction, there is slightly a weak negative correlation and the results were significant at 0.05 level of significance.

Association of Anxiety Score and SPO_2 by Different Duration:



Discussion

From the study we conclude that anxiety of the study participants had an impact on their heart rate. During pre-operative time the heart rate of the study participants was found to be in normal range but before and after induction, anxiety had a significant impact on the study participant's heart rate. The systolic and diastolic blood pressure also had a significant impact due to anxiety before induction. During pre-operative period the effect of anxiety on Systolic and Diastolic blood pressure was found to be non-significant. Similarly, there was no significant effect on oxygen saturation due to anxiety of the study participants.

Berth *et al.* [5] in 2007 conducted a study on The Amsterdam Preoperative Anxiety and

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 04, 2024

Information Scale (APAIS) on 68 patients who needed Orthopaedic surgery. The anxiety and need-for-information scores were both highly reliable and could be replicated using a factor analysis. As predicted, the APAIS scales had a strong correlation with traditional anxiety questionnaires and a low correlation with questionnaires with alternative topics. The APAIS-scales are unaffected by a person's gender, age, or past procedures. Prior to surgery, patients with a stronger desire for knowledge had more anxiety (r=0.59). In our study preoperative anxiety had no relation with age, gender or sex of the patient.

Zakariah *et al.* [6] in 2015 used Malay version of the Amsterdam Preoperative Anxiety and Information Scale (APAIS). They tested on 200 patients using factor analysis, internal consistency, and association with Spiel Berger's State-Trait Anxiety Inventory (STAI-state). Higher anxiety scores were shown to be connected with female gender, operation with a higher risk, and the need for information. They concluded that the Malay-APAIS is a valid and reliable tool for the assessment of patients' preoperative anxiety and their need for information so, we included similar scale to evaluate preoperative anxiety on haemodynamic parameters during induction of anaesthesia.

Bayrak *et al.* [7] in 2019 conducted a study on effects of preoperative anxiety on intraoperative hemodynamic and postoperative pain. A total of 72 individuals were operated on for cholecystectomy. They found no significant link of anxiety with age, gender, marital status, degree of education, career, general anaesthesia, comorbidity, and postoperative shivering. Patients with high preoperative anxiety levels, on the other hand, exhibited unstable hemodynamic parameters during surgery, as well as higher postoperative pain all of which were associated with dissatisfaction [6]. This study showed impact on Heart rate, SpO_2, Systolic blood pressure and Diastolic blood pressure due to anxiety. So our study results correlates with this study.

Djug *et al.* [8] in 2017 conducted a study using Spielberg test on 80 patients to assess preoperative anxiety. Their findings revealed that all of the patients exhibited preoperative apparent anxiety to some degree. The averages mean arterial pressure preoperatively and after general anaesthetic induction differed by 15, 4 mm/Hg, although there was no significant relationship between Spielberg score and blood pressure variances. Similarly in our study period the effect of anxiety on systolic and diastolic blood pressure was found to be non-significant during pre-operative and post-operative period.

Celik *et al.* [9] in 2018 conducted a study on 499 patients to evaluate preoperative anxiety and fear of anaesthesia using Amsterdam Preoperative Anxiety and Information Scale (APAIS). The statements' responses were rated on a Liker scale. Furthermore, patients were questioned about previous anaesthesia. They had significantly higher anxiety sub-scores than patients who underwent regional anaesthesia (p=0.029). Female anxiety sub-scores were found to be significantly higher than male anxiety sub-scores (p=0.001). They concluded that being aware of a patient's concern and finding appropriate approaches to their anxiety might be beneficial. The APAIS is a useful tool for assessing patient anxiety, and it could be useful during preoperative consultations.

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Conclusion

Preoperative anxiety has a significant impact on heart rate, systolic blood pressure, diastolic blood pressure and SpO_2 on patients undergoing general anaesthesia procedure. The outcome of treatment in patients is influenced by preoperative anxiety.

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