

Original article

# Preoperative Mood Disorders in Patients Undergoing Cardiac Surgery: Risk Factors and Postoperative Morbidity in the Intensive Care Unit

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ABSTRACT

**Introduction and objectives:** To estimate the preoperative levels of anxiety and depression in patients awaiting heart surgery and to identify the risk factors associated with the development of these mood disorders. To evaluate the relationship between preoperative anxiety and depression and postoperative morbidity.

**Methods:** Prospective longitudinal study in a sample of 100 patients undergoing heart surgery. We carried out a preoperative structured interview in which the patient completed the Hospital Anxiety and Depression Scale, and sociodemographic (age, sex, marital status, and income) and surgical variables (surgical risk, type of surgery, length of preoperative hospital stay, and surgical history) were also recorded. Pain, analgesic use, and postoperative morbidity were evaluated in the intensive care unit.

**Results:** Thirty-two percent of the patients developed preoperative anxiety and 19%, depression. Age < 65 years (odds ratio = 3.05; 95% confidence interval, 1.27-7.3) was the only significant risk factor for developing preoperative anxiety. A length of preoperative hospital stay  $\geq 3$  days was the main risk factor for preoperative depression (odds ratio = 4.59; 95% confidence interval, 1.6-13.17). Preoperative anxiety significantly increased the postoperative pain and analgesic consumption. Neither anxiety nor depression significantly modified the rest of the postoperative variables associated with morbidity in the intensive care unit.

**Conclusions:** Anxiety and depression are mood disorders that are detected in patients awaiting heart surgery, with age < 65 years and a prolonged preoperative hospital stay being decisive factors in the development of these conditions. Although preoperative anxiety increased the postoperative pain in these patients, their state of mind did not modify their postoperative course.

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## Trastornos del ánimo preoperatorios en cirugía cardíaca: factores de riesgo y morbilidad postoperatoria en la unidad de cuidados intensivos

RESUMEN

**Introducción y objetivos:** Estimar niveles de ansiedad y depresión preoperatorios en pacientes sometidos a cirugía cardíaca y delimitar los factores de riesgo involucrados en la génesis de estos trastornos. Evaluar la relación entre ansiedad y depresión preoperatorias y morbilidad postoperatoria.

**Métodos:** Estudio prospectivo y longitudinal en una muestra de 100 pacientes sometidos a cirugía cardíaca. Se realizó entrevista preoperatoria en la que se completó el *Hospital Anxiety and Depression Scale* (cuestionario de ansiedad y depresión hospitalaria) y se registraron variables sociodemográficas (edad, sexo, estado civil y renta) y quirúrgicas (riesgo quirúrgico, tipo de cirugía, días de ingreso preoperatorio y antecedentes quirúrgicos). En la unidad de cuidados intensivos se evaluó dolor, consumo analgésico y morbilidad clínica postoperatoria.

**Resultados:** El 32% de los casos sufrieron ansiedad preoperatoria y el 19%, depresión. La edad < 65 años (odds ratio = 3,05; intervalo de confianza del 95%, 1,27-7,3) fue el único factor de riesgo de ansiedad preoperatoria significativo. La estancia hospitalaria preoperatoria  $\geq 3$  días fue el principal factor de riesgo de depresión preoperatoria (odds ratio = 4,59; intervalo de confianza del 95%, 1,6-13,17). La ansiedad preoperatoria incrementó significativamente el dolor y el consumo analgésico postoperatorio. La ansiedad y la depresión preoperatorias no modificaron significativamente la morbilidad postoperatoria en la unidad de cuidados intensivos.

Palabras clave:

Ansiedad

Depresión

Procedimientos quirúrgicos cardíacos

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**Conclusiones:** Ansiedad y depresión son trastornos del ánimo presentes en el paciente quirúrgico cardiaco, y la edad < 65 años y la estancia hospitalaria preoperatoria prolongada son factores determinantes en la aparición de estos trastornos. Aunque la ansiedad preoperatoria incrementó el dolor posquirúrgico de los pacientes, el estado de ánimo no modificó su evolución postoperatoria.  
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## Abbreviations

EuroSCORE: European System for Cardiac Operative Risk Evaluation  
HADS: Hospital Anxiety and Depression Scale  
ICU: intensive care unit

## INTRODUCTION

Interest in identifying physiological bases that explain how the variation in state of mind can influence the postoperative recovery of patients subjected to surgery has led to a number of studies, and some have reported high levels of preoperative anxiety and depression with deleterious changes in the neuroendocrine response (cortisol and interleukin synthesis) during the postoperative period in these patients.<sup>1–3</sup>

The authors of some studies carried out with patients undergoing cardiac surgery regard preoperative anxiety and depression as cardiovascular risk factors. They conclude that both disorders can lead to the development of a greater number of postoperative complications over the medium and long terms and result in a lower recovery rate for the performance of activities of daily living, as well as a higher prevalence of chronic postoperative pain, rate of hospital readmissions, and incidence of adverse cardiac events, and lower overall survival.<sup>4–13</sup>

However, the same does not apply to the immediate postoperative period, for which the limited data reported to date in the scientific literature only point in diverse ways to the possible association between preoperative anxiety and surgical complications such as prolongation of the duration of mechanical ventilation, greater hemodynamic variability, higher levels of postoperative pain, and increased use of analgesics and anesthetics, a higher incidence of confusional states, and lower levels of patient satisfaction with the outcome.<sup>14–16</sup>

The objectives of our investigation are, first, to determine the levels of preoperative anxiety and depression in nonpsychiatric patients who are awaiting cardiac surgery. Second, we propose to identify the sociodemographic variables (age, sex, marital status, income) and/or clinical determinants (surgical risk, type of surgery, length of preoperative hospital stay, history of cardiac surgery) that represent risk factors for preoperative anxiety and/or depression. Third, we evaluate the possible postoperative impact of these disorders on the level of pain (intensity and analgesic requirements) and morbidity (length of stay, need for postoperative invasive ventilatory support, presence of ventricular arrhythmias, readmissions, and mortality prior to hospital discharge) in the intensive care unit (ICU).

## METHODS

The study was carried out in the *Hospital de Navarra* between February 2008 and January 2009 and included all the patients admitted to the ICU after undergoing elective cardiac surgery involving cardiopulmonary bypass pump, who had voluntarily agreed to participate in the study and did not meet any of the

established exclusion criteria. The exclusion criteria were: underage patients or those who refused to participate in the study; patients with a diagnosed mental disorder (obsessional neurosis, generalized anxiety disorder, depression, schizophrenia, and any type of phobia); patients taking anxiolytics and/or antidepressants, either recently prescribed or consumed regularly, and those with an evident cognitive deficit or with language disorders that would impede effective communication.

The day before the intervention, the candidate patients were interviewed by the principal investigator using a two-part instrument.

The first part collected, according to the variables of interest for the study, a series of sociodemographic data such as age (<65/≥65 years), sex (male/female), marital status (married/other), monthly income (<1400/≥1400 euros), and other preoperative patient data: European System for Cardiac Operative Risk Evaluation (EuroSCORE) ≤4%/>4%, type of surgery (valve replacement/coronary artery bypass/others), length of preoperative hospital stay (≤2/≥3 days) and history of cardiac surgery with sternotomy (yes/no).

The second part was a psychometric questionnaire that measures the mental distress manifested as anxiety disorder and/or depression experienced during the week prior to the intervention. We employed the Hospital Anxiety and Depression Scale (HADS) designed by Zigmond and Snaith in 1983<sup>17</sup> and subsequently validated in Spain by Tejero et al.<sup>18</sup> This 14-item questionnaire is composed of 2 subscales of 7 questions each, one to assess anxiety (odd-numbered questions) and the other to estimate depression (even-numbered questions).

The intensity or frequency with which each symptom occurs is evaluated on a 4-point Likert scale (range, 0 to 3), with different response options. The score for each subscale is obtained by adding up the values assigned to each of the selected phrases in the respective items and, although the original version of the scale proposes the same cut-off points for both subscales (0–7, normal; 8–10, doubtful case; ≥11, clinical case), other researchers have recently applied this scale to coronary patients,<sup>19,20</sup> as well as in other types of surgical interventions,<sup>21</sup> lowering the cut-off points. Following this model, our study eliminated the “doubtful” group and considered a “clinical case” to be that in which the patient obtained a score of ≥ 8 in either of the subscales.

Once the interview had been completed, after the surgical intervention, the patient record was evaluated according to a series of variables to assess postoperative morbidity: need for postoperative invasive ventilatory support (reconnection to invasive or noninvasive mechanical ventilation after initial postoperative extubation), presence of ventricular arrhythmias (annotated in the medical record and requiring treatment), readmission to the ICU (after initial transfer to the ward), length of ICU stay (from the day of surgery to the day of transfer to the surgical ward), and mortality prior to hospital discharge.

In addition, to evaluate the relationship between mood and postoperative pain reported by other authors,<sup>22,23</sup> and given that all the patients received analgesia according to the protocol currently employed in our unit (8 g of metamizol in 500 mL of saline solution intravenous/24 h plus 1 g of paracetamol intravenous/6 h), we monitored pain intensity during the first 48 postoperative hours (1, 2, 3, 4, 12, 24 and 48 h after extubation and at the time of discharge from the ICU) using the verbal numeric

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