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Review Article

Current Knowledge on Psychic Stress in Surgical Procedures

Abstract

The incidence of stress among individuals submitted to major surgery is relevant. Although it has been noted that some patients go through the perioperative period without presenting stress, surgical patients have a high probability of presenting one of the four phases of stress. Recognizing the stress phase that affects the patient permits the medical team to act in a more appropriate manner and to propose interventions that will prevent worsening of the disease and an unsuccessful outcome of surgery.

The main objective of this paper was to present a review of the most important aspects regarding psychic stress in patients undergoing major operations under general anesthesia.

Introduction

Historical evolution of the concept of stress

Stress is an English word originating from the Latin verb *stringere*, meaning squeezing, tightening. It has been used to describe a situation that threatens the organism, debilitating it and consuming its stored life energy reserve. Stress is constant in human life and can cause reactions of adaptation of the organism to the stressing stimuli.

According to Lipp [1], the first references to the word "stress" with the meaning of "affliction and adversity" date back to the 14th century. According to Spielberger [2], in the 17th century the word started to be used to designate oppression, discomfort and adversity. In the 18th century, the word was used to express the action of a very strong force, pressure or influence on a person, causing distortion. In the same century, speculation was raised about a possible relation between physical and mental diseases and stress, although this hypothesis did not receive much attention from the scientific environment.

In the 19th century, Anglo-Saxon engineers were using the term in the study of the resistance of materials to indicate the tension resulting from a force applied to a body. In other words, an object was compressed until its point of rupture in order to test its resistance. Bernard stated that the internal milieu of the organisms must remain constant despite the modifications occurring in the outer environment.

Years later, in the 20th century, Osler [2], started to consider again the idea of a connection between stressful events and disease and qualified the term stress as excessive work and the term "strain" as worry. In 1910, this author suggested that excess work and worry might be related to coronary diseases. Meyer [3], a Swiss psychiatrist who contributed to the development of psychobiology, created a psychiatric concept relating stressful life events to medical disorders, favoring the development of instruments for the measurement of the relation between life events and stress. The introduction of these instruments intensified the debate centered on the question of whether the event itself represented the problem or whether the question was centered on the personal perception of the event as a problem.

Straub [4], suggested that the first author to use the term stress was Cannon. In an experiment on cats conducted in 1932, this investigator observed that the animals developed a body response to the barking of dogs, called fight-flight reaction, with the release of adrenaline which, together with cortisol, helps prepare the organism to defend itself from a threat. In 1939, Cannon [5], suggested the term homeostasis in order to designate the effort of physiological processes in order to maintain a state of internal equilibrium in the organism despite the external changes in the environment. This definition encouraged subsequent investigations.

In 1936, Hans Seyle [6], University of Montreal, used the term stress to designate a syndrome produced by several harmful agents acting on the organism and resulting in chemical disequilibrium. Seyle was the first scientist to formulate an original theory about stress based on a physical response not specifically related to environmental changes. This author initially described stress as "all the effort exerted on the organism that exceeds its capacity for adaptation", and characterized it as a physiological change that occurs when the organism is in a situation that requires an alternative to its normal organic activity, with a consequent overload. According to this author, the most important aspect of a stressor is its impact on the body.

In studies on rats, Seyle [6], observed that the alarm reaction causes the adrenal cortex to increase in size and to remain hyperactive, while the thymus, the spleen and the lymph nodes are reduced in size, and ulcers appear in the stomach and intestine. His studies culminated with a theory about the way mental and physical stress become a source of psychosomatic problems through the action of the hypothalamus-pituitary-adrenal axis. In 1936, Seyle called this process "general adaptation syndrome" (GAS), a set of nonspecific responses of the organism – especially of the endocrine glands and of the nervous system – to stress. Regardless of the source of biological stress, the organism reacts with the same response pattern in order to maintain its equilibrium.

In human beings, this response pattern is characterized by physiological changes which cause modifications of structure and of biochemical and organic composition. Some of these responses are manifestations of adaptations of the body and of its defense mechanism against stress, such as nervous or emotional perturbations, arterial hypertension, peptic ulcers, allergies, and cardiovascular and renal diseases, among others. In the presence of GAS, dilatation of the adrenal cortex, intestinal ulcers and thymolymphatic involution also occur [6].

In 1939, Alexander [7], stated that the negative circumstances and attitudes of life may lead to disease and to sudden death via the mental modulation of the autonomic, endocrine and iconologic systems. In his work, he observed how stress during an early period of life can overstimulate the thyroid gland to produce a precocious, but precarious, type of psychological maturity. He also recognized that psychic stress somehow interacts with the hypothalamus, which in turn stimulates the endocrine system via the pituitary and the thyroid.

Today, the term stress has been used to describe the stimuli that generate both a breakdown of the homeostasis of the organism and the behavioral response created by this disequilibrium. According to Lipp [8], stress is a reaction of the organism with psychological, physical, mental, behavioral and hormonal components that occurs for adaptation to an intensely anguishing event or situation. The occurrence of all these reactions in the body is called psychosocial stress. Yamamoto et al. [9], described physical and psychic components involved in the stress, evoke physical and psychological responses in humans and make them to restore their homeostasis after a physical or psychical threads.

According to Straub [4], the psychological component involves emotional states such as anxiety and fear. Lipp [10], also added states of irritability, impatience, depression, anguish, anger, and apathy. Other authors consider laughing, smoking and expressing oneself in a pessimistic manner as manifestations of behavioral stress [4].

The physiological component involves various symptoms, mouth dryness, arterial hypertension, and cardiovascular and digestive disturbances. In addition to these symptoms, stress involves increased sudoresis, insomnia, diarrhea, tachycardia, changes in appetite, muscle tension and tooth grinding, among other manifestations [10].

Seyle [6], considers stress to consist of three phases, i.e. alarm, resistance and exhaustion. The author observed that stress implies suffering, although during the initial phase (alert) there may be increased disposition and energy, revitalization of strength and acceleration of life rhythm, as if the person were living in a constant state of anxiety. If this situation persists over a long period of time, it generates organic wear, possibly progressing to a worse level of stress and the onset of diseases.

In the second phase, called resistance, the internal homeostasis breaks down with trends to the re-equilibrium of the organism. A marked utilization of energy and an increase in resistance occur, circumstances that may generate a sensation of generalized wear of no apparent cause. The greater the effort of an individual to adapt and to re-establish homeostasis, the greater the wear. If the stressful factors persist in terms of frequency or intensity, the capacity for resistance will break down and the organism will progress to the phase of exhaustion.

In the third phase, called exhaustion, there is a total breakdown of resistance and some of the symptoms that will appear will be similar to those of the alert phase, although of a much greater magnitude. Serious diseases such as infarction, ulcers, psoriasis, depression, and others may occur and affect the more vulnerable organs. There is an increase of lymphatic structures, of psychological exhaustion in the form of depression and of physical exhaustion in the form of incipient diseases, with death possibly occurring as the final result. According to Seyle [6], the exhaustion phase, although quite severe, is not necessarily irreversible as long as it does not affect the organism as a whole.

In a study on adults, Lipp [10], identified an additional phase of quasi-exhaustion between the phases of resistance and exhaustion. In this phase, the organic defenses start to give way, causing diseases and the deterioration of the function of the more vulnerable organs. The organism can no longer resist tension and tries to re-equilibrate. There are oscillations between periods of well-being and tranquility and periods of discomfort, tiredness and anxiety. Diseases start to arise, indicating that resistance is no longer so effective. If there is no relief of stress by means of the removal of stressors or by the use of coping strategies, stress will reach the final phase of exhaustion.

The diagnosis of stress can be made in different ways. Some authors indicate the categorization of major vital events which require a person to use a large amount of adaptive energy to face the situation. Another way to measure stress is by the determination of the levels of blood catecholamines, hormones that are present in the neuroendocrine reaction to stress. Lipp [10], proposed that stress should be measured on the basis of the sum of the symptoms presented by a person when in contact with a stressful event. The occurrence of stress is determined on the basis of the physical and psychic symptoms verbally reported by the patient or manifested clinically when he experiences a stressful situation. Most of the texts surveyed express measurements of stress by means of physical and biological parameters and further investigations are needed for an in-depth approach to the psychic components of stress.

Psychic stress and major surgeries

Several circumstances can generate stress, such as emotional and social impacts and biological conditions. Among them are an increasingly intense life rhythm, exacerbated competition, excessive work, excessive worry, affective and financial losses etc. Some therapeutic situations involving clinical treatment and operations under general anesthesia are considered to be strong stressful stimuli because they affect the emotions of the patients and generate a breakdown of the equilibrium of the organism.

The incidence of stress among individuals submitted to major surgery is relevant, as confirmed in various studies. Although it has been noted that some patients go through the perioperative period without presenting stress, surgical patients have a high probability of presenting one of the four phases of stress described above.

Recognizing the stress phase that affects the patient permits the medical team to act in a more appropriate manner and to

propose interventions that will prevent worsening of the disease and an unsuccessful outcome of surgery. It also permits the team to start patient guidance when the resistance, quasi-exhaustion and exhaustion phases are detected, the last one being the most serious and the most likely to have irreversible consequences for the patient.

According to Giannoudis et al. [11], surgical stress is defined as the impact exerted on the human body by surgical procedures. And surgical trauma causes perturbation of the immune and psychic system in the attempt to preserve homeostasis and survival, generating the stress reaction. Thus, traumas, diseases and the use of medications can affect the emotions, trigger a state of stress and influence its magnitude.

Kiecolt-Glaser et al. [12], stated that emotions have direct effects on stress hormones and may modulate the immune function. The emotional response to surgery may influence the type and quantity of anesthesia administered and may have variable effects on the immune and endocrine systems. More anxious individuals will probably experience more intense postoperative pain with a consequent reduction of the immune function.

According to Abecasis [13], the surgical act represents a paradigmatic situation of stress that involves the patient, his family, the surgeon, and also the anesthesia and surgical teams, increasing the morbimortality of all. Callahan [14], stated that major surgery can be seen as a significant stressor event and that the intensity of the duration of the surgical stress response (SSR) depends primarily on the severity and duration of the stress stimulus.

According to Hoyo [15], the patient's attempt to deal with the various stress stimuli involved in submitting to an operation triggers the GAS phenomenon described by Seyle [5], with the development of manifestations of body adaptation as a mechanism of defense against stress. In surgical patients, this syndrome occurs as follows: the patient reveals emotional and physical wear already during the preoperative period, as confirmed by interviews, physical examination and specialized tests. Some patients feel euphoric but also experience a crisis because of the surgical act. Waiting for the results of complementary tests generates very deep psychological disturbances due to the uncertainty about the results. In this situation, the adrenal glands become very active and release norepinephrine into the blood circulation. This hormonal discharge can last days or weeks and maintains high hormonal levels. In many cases the patient is controlled and can move around, but he is depressed due to the secretions of the adrenal glands, which may provoke physical and emotional decompensation. After surgery, he becomes more relaxed since the adrenals become hypofunctional. Between 7 and 15 days after surgery, the patient returns to a euphoric state, and in the third week he or she overcomes the stressors.

Vicencio [16], stated that there are external stressors such as changes in the physical environment and daily rhythm with alterations in the biological and circadian rhythm, deprivation of sensory stimuli and loss of day and night sense and of the changes of season etc., mainly for patients undergoing long periods of hospitalization. The sudden separation from his family when he is removed from his habitual environment and taken to a different, impersonal one may cause the patient to feel deprived of affective stimuli and to be unable to communicate his anguish or apprehension related to his disease. The relations with the health team including with physician should also be considered.

Internal stressors are those linked to the disease itself, post-traumatic immune depression, pain, functional disability, and other limitations. Giacomantone [17], observed that many patients develop emotional symptoms such as fear, anguish, anxiety, and fantasies related to general anesthesia and to the operation itself. These states represent the preoperative stress and repeatedly occur in different patients. General anesthesia elicits the fear of death, which generates anxiety, loss of emotional control, passivity and dependence on the doctors.

Baruá [18], defines emotion as a tendency felt with respect to an object perceived as good or bad which is reinforced by specific bodily changes. All emotions raise a subjective impression and may manifest by means of an objective behavior. When the object that induces emotion in considered as good by the person, who experiences this emotion, it represents a reward and the emotion is positive. On the other hand if the object is considered as bad, it becomes a punishment and the emotion is negative. We may state that the perception of surgical procedures is individual and depends on the sum of previous experiences. This state will influence how the patient copes with the surgical process.

The attitude of the surgeon determines to a great extent the intensity of stress. It is possible to instrumentalize the surgeon-patient relationship, transforming it into a psychotherapeutic technique with the precise objective of adequately modulating stress.

Objective

1. To review the literature about psychic stress in patients submitted to major surgeries under general anesthesia.
2. On the basis of a literature review, to analyze the relation between psychic stress and major surgeries.

Methods

The study was conducted using reports available in the data bases Pubmed interface to Medline, National Library of Medicine, Literatura Latinoamericana y del Caribe en Ciencias de la Salud (LILACS) and Virtual Health Library, as well as technical books and national and international publications.

The survey covered the period from 1998 to 2008. More than 800 articles were found and 18 of them containing references to the psychic focus of stress were selected. Two articles referring to the years of 1984 and 1987 were also selected. Only texts regarding major operations performed under general anesthesia in adult patients were considered. The review concerned stress and operations under general anesthesia in order to determine the influence of patient emotional stress during the perioperative period.

The strategy used for the survey of the data bases initially covered the following key words: stress, surgery, surgery major, and anesthesia general, psychic. For the identification of articles published during

the period from 1998 to 2008, the following key words were surveyed in the MESH data base: surgery, operation, stress, preoperative, postoperative, psychology, general anesthesia. The limits used were adult patients of both sexes aged 18 to 82 years, and major surgery.

Key words indicating the type of surgery were later used: Arthroplasty, Replacement, Hip AND Anesthesia AND stress; Gastroplasty AND stress ; Gastroplasty AND Anesthesia AND stress; Myocardial Revascularization AND Anesthesia general AND stress; Laryngectomy AND Anesthesia AND stress; Esophagectomy AND Anesthesia AND stress; Colectomy AND Anesthesia AND stress; Gastrectomy AND Anesthesia AND stress; Laparotomy AND Anesthesia AND stress; Thyroidectomy AND Anesthesia AND stress; Prostatectomy AND General Anesthesia AND stress; Otorhinolaryngologic Surgical Procedures/psychical" [Mesh]; OR "Digestive System Surgical Procedures/psychical" [Mesh]; OR "Castration/psychical "[Mesh]; OR "Hypophysectomy/psychical"; "Islets of Langerhans Transplantation /psychical" [Mesh]; OR "Parathyroidectomy/psychical" [Mesh]; OR "Thyroidectomy/psychical" [Mesh]; AND "Stress, psychical" [MeSH Major Topic]; OR "Stress"[MeSH Major Topic]; OR "stress" [tw] OR; "distress" [TW] AND "humans"; "Stress, psychical" [MeSH Major Topic]; AND "Surgical Procedures, Operative" [MeSH Major Topic] AND Patients AND "last 10 years"[PDat] AND Humans [Mesh] AND "last 10 years" [PDat] AND Humans[Mesh].

Data were analyzed in two stages. The first included the identification of the professional background of the authors, the focus of the articles, and the type of research carried out, the population studied, the country where the study originated, and the instruments used for the measurements. The second consisted of the categorization of the topics according to their pertinence to the objectives of the present study. The major categories identified were: concept of surgical stress, predisposing factors, influence of stress on surgical patients, and coping strategies.

Results

Of the 18 articles dealing with psychic stress in surgery, four were produced in the United States, four in Brazil, four in Argentina, and one each in Canada, Chile, Cuba, England, Japan, and Peru. Regarding the professional category of the authors, 28 were medical doctors, 11 were psychologists, three were nurses, and two were dentists. Table 1 summarizes some important papers regarding stress in relation to surgical procedures.

Fifteen articles dealt with the theory of stress in general and of stress related to surgery. Research was carried out in only three articles. Two dealt with the validation of instruments for the measurement of stress, with research conducted on humans: Lipp and Guevara [1], validated the Lipp Stress Symptom Inventory - LSSI in a study involving 124 university students and 105 adults in general, for a total of 229 persons in São Paulo, and Yamamoto et al. [9], validated the Inventory to Measure Psychosocial Stress - IMPS and Inventory to Measure Stress Tolerance Capacity - IMST in a study on 1499 public school teachers in Japan. In the third, Santos et al. [19], compared the postoperative stress of patients from Sergipe submitted to cholecystectomy to the stress of patients under clinical treatment for gastritis.

Regarding the concept of stress, some of the selected texts written by psychologists and medical doctors adopted the triphasic model of Seyle [6], to analyze it. Many of them used an approach to stress based on biological markers and emphasizing the need to control this disorder in hospitalized patients to prevent a worsening of the clinical picture. Other articles described in detail the physical and emotional implications of stress. Articles by nursing professionals emphasized the care to be provided to the patients to minimize their stress. Among the texts written by dental professionals, one had a multidisciplinary approach and the other emphasized the influence of tooth extraction on the psyche of the patient, relating the procedure to the castration neurosis described by Freud. It was also observed that stress has physical and psychic components. Knowledge of its various forms of manifestations helps the health team to manage it in order to obtain patient well-being and re-establishment.

Several Brazilian studies have emphasized the implications of excessive stress in the health area [20-24] and the need for programs for the prophylaxis and treatment of stress before more serious diseases become established. However, one of the difficulties arising in this area concerns the diagnosis of the stress phase.

There are several possibilities of measuring stress, i.e., by means of physical parameters such as blood pressure (its increase is directly related to stress), blood catecholamine levels and blood hormone levels such as cortisol (called stress hormone). Stress can also be measured with psychometric scales. The first scale was elaborated by Holmes & Hahe [25], in 1967, which lists the stressful events that influence the life of man, placing them in decreasing order of influence. Other investigators have created specific instruments for the measurement of occupational stress. In 1989, Lipp elaborated the Lipp Stress Symptoms Inventory (LSSI) which intends to identify stress symptoms in a rapid and objective manner, classifying them as physical and psychic. During this standardization, in 2000, Lipp described a fourth phase she called quasi-exhaustion. Since the literature on this topic is scarce due to the fact that most authors are medical professionals, there is no qualitative approach to psychic stress. It can be seen that the psychic symptoms of stress are not taken into account and that only physical parameters are considered in most studies.

Yamamoto [9], developed two instruments for the measurement of stress: the Inventory to Measure Psychosocial Stress (IMPS) and the Inventory to Measure Stress Tolerance (IMST), which were validated. In addition, Everly and Sobelman [26], in 1987, suggested that stress should be measured by evaluating cognitive and emotional aspects. Andreassi [27], 1980 and Everly [28], 1990, proposed the measurement of the physiological response to stress by means of electrodermal techniques, electromyographic procedures and cardiovascular measurements.

Some authors define surgical stress as the impact exerted by surgical procedures which may trigger a series of postoperative complications and, in extreme cases, may contribute to patient death Giannoudis et al. [11]. According Seyle [29], and Mc Cleland, Ross and Patel [30], stated that stress can be evaluated at the neuroendocrine level based on the levels of catecholamines in plasma, urine and saliva samples. Seyle also stated that "one of the typical traits of general adaptation

Table 1: Characterization of the literature on psychic stress among surgical patients during the period from 1994 to 2008.

Authors	Study population	Study site	Summarized description
Sosmow I, in Borland LR	Review study	Buenos Aires, Argentina	Emotional significance of tooth loss
Santos AF, Santos LS, Melo DO, Alves Jr, A	15 surgical patients 10 clinical patients	Aracaju, Brazil	Comparison of preoperative stress in cholecystectomy patients
Camargo Jr, KR	Review study	Rio de Janeiro, Brazil	Occurrence of psychiatric complications in cardiac surgeries
Escobar IC	Review study	Havana, Cuba	Physiological response to surgical stress
Carvalho TR	Review study	São Paulo, Brazil	Evolution of the historical concept of stress and its repercussions on the organism
Vicencio EA	Review study	Santiago, Chile	History of stress and its implications in surgical patients
Yamamoto K, Irie M, Sakamoto Y, Yoshinari M	1499 public school teachers	Fukuova, Japan	Validation of the stress detection test - IMPS in public school workers in Japan and comparison with biomedical parameters
Iribarren C	Review study	Buenos Aires, Argentina	Psychological doctor-patient relationship in surgery
Stagnaro JC, Hoyo EH, Cabral C, Torrieri A, Giacomantone E	Review study	Buenos Aires, Argentina	Discussion of the psychological and organic aspects of stress in patients submitted to surgery
Kiecolt-Glaser JK, Mc Guire L, Robles TF, Glaser R	Review study	Columbia, Ohio, USA	Psychoconeuroimmunol-ogy and psychosomatic medicine: Back to the future
Lipp, MEN,Guevara AJH	229 adults Aged 20 – 50 years	São Paulo, Brazil	Empirical validation of the Inventory of Stress Symptoms for adults
Callahan L	Review study	California, USA	Effects of surgical stress on postoperative patient care
Mertin S, Sawatzky JAV, Diehl -Jones WL, Lee TWR	Review study	Winnipeg, Canada	Review of the physiology and pathophysiology of stress response syndrome
Kiecolt-Glaser JK, Page G, Marucha PT, Mac Callum RC, Glaser R	Review study	Ohio, USA	Psychological and behavioral influence of the response to stress on surgical recovery
Gianoudis PV, Dinopoulos H, Chalidis B, Hall GM	Review study	London, England	Response to surgical stress
Andersen BL, Farrar WB, Golden-Kreutz D, Kutz [a] L, Mc Callum R, Courtney E, Glaser R, Abecasis I, Barúa RL	116 patients Review study	Columbus, Ohio, USA Rosário, Argentina Lima, Peru	Application of a questionnaire of stress evaluation to cancer patients Surgeon's attitude towards patient stress Stress, emotional disorders and diseases. The role of psychological aspects in medicine

syndrome GAS is the sugar curve in blood, which follows a triphasic course, with an initial reduction followed by an increase and a new reduction. Wyler, Masuda and Holmes [31] and Miller and Smith [32], suggested that the diagnosis should be made by considering the disease that has already manifested in some organ. Kanner et al. [33], suggested that in addition to determining major stressors, small bothers should also be evaluated since they have a cumulative effect on the organism.

According to Torrieri [34], stress also occurs in three stages in surgical patients. In the first, the alarm phase, the central nervous system is stimulated and there is catecholamine release from the hypothalamus, which may cause arterial hypertension and tachycardia. The alarm reaction is not a pathological phenomenon. If the stressor is of short or medium duration, this phase is part of the adaptive process of the organism. Most of the morphological and biochemical changes of the alarm reaction disappear during the resistance phase. In the second stage, the body is mobilized to prepare itself for the fight-or-flight response.

Literature describes the ability of the organism to remain in the resistance stage as limited, with a possible consequent exhaustion of the adaptation energy. In this phase, the patient does not present the symptoms of the preceding phase, but may have fear reactions. The third phase (exhaustion), is the one in which the adaptation energy predisposes to disease and even to death. According to this author, the intensity and duration of the response to surgical stress depend [35], on the intensity and duration of the stressor stimulus. The more invasive and complex the surgical procedures, the more they are associated with a high risk of the occurrence of the exhaustion phase, with physical and psychic consequences [18].

A large amount of physical and psychic energy is mobilized during the preoperative period so that the patient will establish ways of coping with the situational stress [19]. According to Napolitano et al. [36], this stress, if expanded and prolonged, increasing the systemic inflammatory response and contributing to increased perioperative morbidity and mortality.

Several authors have supported the idea that post-traumatic stress can deregulate the organism, causing a state of immune depression that intensely affects it, with consequent mortality especially due to infections [16,37]. Many literature reports regarding psychosomatic medicine, especially studies of psychoneuroimmunology [37], indicate that strong fear and stress before an operation are associated with difficulties in recovery. A long period of hospitalization, enhances perioperative complications, high rates of re-hospitalization, and mortality, especially due to infections. During the perioperative period the patient experiences mobilization of a large quantity of mental and psychic energy, which generates emotional wear and may compromise recovery.

Psychic activity has been evaluated in different manners. Kornfeld

[38], used scales for the assessment of personality, whereas Kinballe [39] and Kennedy and Bakst [40], preferred psychiatric interviews allied to the observation of patients scheduled for heart surgery. These authors elaborated a classification of the stages through which patients pass during the preoperative period. The first group included patients who recognize the risk of surgery and the possibility of dying, but who block any fear by means of denial. The second group comprised patients who appear to be cooperative but whose secondary gains – rewards – are so important that they subconsciously sabotage the treatment and, if they accepTable to be submitted to an operation, they will benefit very little from its results. The third group consisted of patients who, experienced increasing panic, suffering an intense conflict between the motivation for the operation and fear. The fourth group was of patients immobilized by a conflict between the wish to get better and the fear of losing the secondary gains derived from the disease. The fifth group included patients with strong depressive components who seek death. In such cases, these authors defined surgery as "sanctioned suicide". The patients in the sixth group have psychiatric characteristics masked by complaints that give the impression of heart disease with a surgical indication, whereas they have a severe mental disease with characteristics associated with schizophrenia. According to these authors, most patients belong to the third and fourth groups, indicating that ambivalence appears to be the most common reaction to a radical and intense stressor such as heart surgery. Further studies are needed to determine whether the symptoms corresponding to psychic stress apply to patients submitted to other types of surgeries.

Discussion

The response to stress varies individually and is influenced by multiple emotional, physical, familiar, social and hospital factors related to operations that trigger the phenomenon. One challenge is to understand how people cope with stress, probably the best way to deal with stress is to establish individual coping strategies according to previously acquired experience. Coping is the process by which an individual administers the internal and external demands perceived as stressful and the emotions they generate [41].

The greater difficulty is to compare theoretical studies. The articles point out that there are internal and external sources of stress with physical, emotional, behavioral and hormonal components that contribute to the occurrence of stress during the perioperative period.

The surgical act is an event seen as paradoxical by the patient since, while it relieves pain and is effective for the treatment of disease, it is also an act of aggression against the organism which induces coping mechanisms. In studies conducted by dentists [42], it was observed that the extraction of a tooth contributes to the development of castration neurosis. Thus it is possible only imagine the impact of major invasive acts such as surgery on the patient.

Woolger [43], an English psychologist, observed in his patients memories of aggression, torture and body damage which arose when they faced surgical interventions. The patients interpreted the invasive procedures as necessary and a repetition of events fixed in their memory in order to consent torture. There is also speculation about the relation between plastic surgeries and aggressive events stored in the memory. Lipp [8], studied this topic when she proposed the theory of "life themes", which refers to chronic and recurrent stress, and investigated the need to recreate in the present, stress-generating situations faced in the past by mechanisms of re-living past situations of life. These themes are repeated in the life generating excessive stress and contributing to a chronic sensation of fragility facing the world.

There are physical and psychic components of stress which act for the defense of the organism, while at the same time causing a deterioration of its condition. It is relevant to point out that psychic factors are present in many patients, often at greater proportions than physical factors. The surgeon usually does not know how to deal with stress and there is the need to add psychologists to the health teams of hospitals, i.e., professionals able to make a diagnosis of stress and to act with the patient in order to minimize its effects. It can be seen that there is a gap to be filled by psychologists in order to help the patient to overcome fears and fantasies about the surgery in an assertive manner [5].

Little is known about the feelings of patients before and after surgery, but a better understanding of this topic started to be obtained after the publication of the Lipp inventory, which provided a quantitative evaluation of the various feelings. The psychic approach should be essentially qualitative and should mainly be used to extract the various feelings associated with each phase of stress. More tests could be validated in order to increase the supply of instruments for the measurement of stress that would contemplate this approach. The experience with the ISSL was positive although the instrument does not focus on fear of the patient about the surgical procedures and death. Several patients express a fear to die during surgery or because of it.

Final Considerations

The psychic stress of surgical patients has been little studied, and specific literature about the topic is difficult to find and to compare its theoretical characteristics. The postoperative course is more favorable in those who develop adequate coping strategies.

The psychic care for surgical patients should start during the preoperative visits, when the patients should have the opportunity to talk about the surgical procedure and to have their doubts clarified. With this approach it would be possible to obtain a better surgical result.

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