Abstract
Background: Postoperative delirium is a syndrome that causes serious consequences, increasing mortality and morbidity rates and extending hospital stay. Purpose: This research was carried out to determine the cost associated with the development of delirium in patients over 65 years of age after major surgery. Method: One hundred twelve patients who were hospitalized for a surgical operation in the orthopedics, neurosurgery, and general surgery clinic of a state hospital for 3 months were evaluated simultaneously and independently for delirium. Patients were observed by clinical nurses 3 times over a 24-hour period. 197 samples were observed for the diagnosis of delirium using the Individual Information Form, Nursing Delirium Screening Scale (Nu-DESC), Post-Surgery Process Costs Evaluation Form and Mini-Mental State Examination (MMSE). However, due to the missing and incorrect completion of the items in the scale, the scale data of 55 samples were excluded by the observers. The observation results of 112 participants who agreed to participate in the study on a voluntary basis constituted the sample of the study. As a medical record examination, the data of the patients’ laboratory, radiological and pharmaceutical information, their length of hospital stay, and the costs of patients with and without delirium were analyzed. SPPS 25.0 statistical package program was used to evaluate the data. For statistical significance, p <0.05 was considered sufficient. Results: The incidence of delirium after surgery was 25 percent. Delirium was more common in men aged 75 years or older, with multiple drug use, with long anesthesia, comorbid disease, low levels of Hb, and albumin, and the results were found statistically significant (p <0.05). It was found that delirium increased the cost of care by prolonging the stay in the hospital. As a medical record examination, a significant difference was found between patients’ laboratory, radiological and pharmaceutical information, length of hospital stay, and the cost of patients with and without delirium (p <0.05). Conclusion: Evidence-based effective treatment protocols for delirium after major surgery and risk factors for preventive interventions need to be identified. In addition to increasing the cost of hospitalization, delirium increases the need for post-acute care and the care of elderly patients to caregivers. Prevention of delirium can not only reduce the cost of delirium but also reduce the subsequent dementia rate. It should focus on delirium-prone patients who are at risk when designing future delirium prevention strategies or in future etiological studies. Key words: Delirium after surgery—old age—risk factors—cost

1 BACKGROUND
Post-surgical delirium (CSD); is defined as an acute neuropsychiatric syndrome diagnosed by a temporary and reversible brain dysfunction that can be seen after surgery, with physical or physiopathological reasons, sudden consciousness, and orientation disorder. Acute onset, (Martinez, Tobar, & Hill, 2015, RNAO, 2016). In general, it is a condition in which nerve cells due to the insufficiency of oxidative metabolism of the brain cannot get the necessary oxygen and glucose (Ehlenbach et al. 2010). Although delirium physiopathology cannot be fully explained, many different assumptions are proposed. The most important of these assumptions are disorders in cerebral oxidative metabolic processes and multiple neurotransmitter deviations (Hshieh et al. 2008, Fong et al. 2009, Trzepacz et al.
In addition to these assumptions in physiopathology, delirium in the classification made by considering psychomotor behavior change; It is divided into 3 (three) categories as hypoactive, hyperactive, and mixed type. These (Robinson and Eiseman 2008, Mouzopoulos et al. 2009, RNAO 2016): 1. In the hyperactive delirium table, the patient’s psychomotor activity has increased; it is hypersensitive to stimuli. 2. In the hypoactive delirium table, the patient’s psychomotor activity and sensitivity to stimuli decreased. 3. Mix delirium is the type of delirium where the patient’s hyperactive and hypoactive table is seen together during the day. Risk factors that cause these types of delirium to be seen are examined in two categories;

Predisposing risk factors: These are the factors that predispose to delirium. Factors that exist in the admission of the patient and affect the sensitivity of the patient; male gender, fractures, depression, visual disturbances, dementia, age are among the most obvious of these factors. Risk factors that initiate delirium: These are the triggering and accelerating factors that cause the development of delirium. Surgical interventions, fluid-electrolyte disorders, pain, presence of invasive catheters (CVP, urinary catheter, NG catheter, etc.), medicines (especially neuroleptic, narcotic, etc.) hearing aid-glasses, etc. use, service / intensive care, etc. length of stay, etc. one of the most obvious of these factors (RNAO 2016, DeWitt, 2018). Although many factors cause delirium, it is observed more in some patient groups. These patient groups; elderly patients are those undergoing cardiac and hip surgery (Holroyd-Leduc, Khandwala & Sink, 2010; Martinez, Tobar, & Hill, 2015). Depending on the age, the delirium table can be seen in any age group, but it is stated in the literature that the incidence of 60 years and above increases, and the age of 80 and above is a significant risk (Fong et al. 2009). The fact that surgery is both a risk factor and the incidence of delirium in the surgical clinics in the postoperative period is higher than that of the internal medicine clinics. The frequency of delirium after surgery can vary depending on the type of surgery and anesthesia. The incidence of delirium after surgery is reported to be 32-50% for cardiac surgery, 21-48% after peripheral vascular disease surgery, 41% after total knee replacement surgery, and 40-60% after femoral neck fracture surgery. In the postoperative period, a higher rate of delirium is observed on the 1st and 3rd days after the intervention, but it can also occur on the other days (Carecenì and Grassi 2011).

Delirium; It has negative effects on patients, patient relatives, health system in terms of emotional, functional and financial aspects. These effects are; Increases the duration of hospital stay, mortality and morbidity and hospital costs increase (Morandi et al. 2009, Koster et al. 2011, Eijk and Slooter 2010, Banerjee et al. 2010). Cognitive and functional losses, which have long-term effects of delirium, may continue in the period after discharge, causing patients to be hospitalized again (Eijk and Slooter 2010, Koster et al. 2011). Because of its negative effects on health, the symptoms of delirium are not yet fully recognized and because it is confused with different cognitive disorders, it is generally not noticeable by health professionals (Fong et al. 2009, Banerjee et al. 2010). Healthcare professionals use various scales for delirium, screening, diagnosis, and determining their severity. Risk factors to be defined, except for delirium screening scales; By increasing the specificity of the diagnosis of delirium, it will provide early diagnosis and will reduce morbidity and mortality rates, thereby positively affecting diagnosis and treatment costs. There is a need to determine the risk factors for evidence-based applications aimed at preventing the negative effects of delirium in surgical clinics at an early stage and preventing them in the early period. With these preventive applications, early diagnosis will be provided for delirium, morbidity and mortality rates will be reduced, and diagnosis-treatment costs will be positively affected. In addition, this study, which requires a multidisciplinary team approach, is an important indicator of the education level, knowledge, skill, clinical experience and the roles and responsibilities of the members of the health team in the care and management of delirium patients.

2 METHOD

Purpose and Type of Research

Cross-sectional and descriptive research was carried out in patients over 65 years of age after major surgery to determine delirium development and associated costs.

Research Hypothesis

The hypothesis given below was tested in the research. H1: There is a difference between the postoperative costs of patients with and without delirium after surgery.

Setting and Sample

The study population consisted of the patients who were admitted to the orthopedic, neurosurgery and general surgery clinics between June 2018 and September 2018 when the study was conducted in a public hospital. No sampling method was used in the study and all of the universe was included in the study. 167 samples were observed for the diagnosis of Nu-DESC scale delirium. However, due to the incomplete and inaccurate completion of the items in the scale by the observers, the scale data of 55 samples were excluded. 112 participants who agreed to participate in the study on the basis of volunteerism formed the sample of the study. Sample exclusion criteria are as follows; patients on ASA score III, patients under 18 years of age, patients with preoperative delirium history, patients with history of neurological or mental illness, sedatives or antidepressants, patients using glucocorticoids, with a language barrier, serious hearing or visual impairment, alcohol or drug addiction is not included. In addition, patients were included in the study at least 24 hours before the operation and the participants were observed with the scale until discharge.

Measurements/Instruments

In the study, Individual Information Form, Nursing Delirium Screening Scale (Nu-DESC) and Post-Surgery Process Costs Evaluation Form, "by DSM-IV criteria were used. The data were observed by the nurses working independently in clinics and the diagnoses of all cases were collected by two specialist neurologists, one in day shift and one in night
shift. Postoperative cost - laboratory (blood tests) of patients, radiology, intensive care stay days, intensive care bed use and maintenance expenses, technical cost information for clinical care expenses, doctor and nurse monitoring forms, data of the hospital billing unit taken using.

Individual Information Form: The questionnaire consisted of questions about age, gender, marital status, educational status, medical diagnosis, concomitant chronic diseases, smoking, alcohol use status, continuous drug use status, ASA physical condition, anesthesia type, duration of anesthesia and duration of surgery, stay in intensive care. Questions were determined to determine the duration and length of hospital stay.

Nursing Delirium Screening Scale (Nu-DESC): Gaudreau et al. (2005), developed by Nurse Delirium Screening Scale. In this study, it was found that Nu-DESC was psychometrically validated and had 85.7% sensitivity and 86.8% specificity. It is concluded that Nu-DESC is promising for clinical use in in-hospital research environments and as an instrument that can be used in research. Nu-DESC is a 5-item observation scale that can be completed quickly. Orientation disorder, inappropriate behavior, inappropriate communication, illusion-hallucination, psychomotor deceleration nurse are the items of delirium screening scale. Each item is evaluated in the form of triple Likert 0-3. The total score of the scale is obtained by collecting the values of the items and the highest score is 10. If the total score is 2 and above, it is diagnosed as delirium. It takes less than 2 minutes to complete and is intended for use by nurses.

Evaluation of Delirium: Daily delirium assessments of the patients were performed by Nu-DESC, two neurologists and trained nurses. Screening took place every day for 24 hours. Since delirium was frequently seen on the second or third postoperative day, patients were observed for the diagnosis of delirium in total 1344 times, days apart 3 times a day from the day before surgery to the day 3 postoperatively and information about the observations was recorded. The presence of delirium was determined by clinical nurses and two neurologists by DSM-IV criteria as a gold standard. The presence of delirium was determined by clinical nurses and two neurologists by DSM-IV criteria as a gold standard. The total incidence was determined to be 25 percent. Patients in the study; It was determined that delirium developed in 25% of the patients (n = 28), delirium did not develop in 75% of the patients (n = 84). This difference was statistically significant ($\chi^2 = .50$, $p = 0.000 < 0.05$). The total incidence was determined to be 25 percent (Table 1).

When delirium development day is evaluated in the patients who were subject to the clinic first were transferred to the intensive care unit after the operation. Patients with intensive care transfer were excluded from the study.

Post Surgery Costs Evaluation Form: It is a follow-up form that includes processing costs for treating delirium seen after surgery, developed using the knowledge of the literature by the worker (Franco et al., 2001). In the cost of Patient Care Services: (1) Observation/monitoring, (2) documentation, (3) communication (e.g., physicians, inter-nurses and telephone calls), (4) preventive measures, (5) mobilization/assistance, (6) security measures (use of intensive care unit or single room), (7) administration of medicines, (8) personal care (for example, assurance and guidance), (9) increased primary care and (10) two staff required for maintenance, radiological examinations, laboratory examinations, drug expenditures, direct and indirect expenditures. This documentation of the time spent was done by both nurses and doctors from the beginning to the end of the delirium department. Therefore, if a patient has several delirium attacks, each attack is blended and separate expenses documented. During the daily transfer from the nursing team to the physician team, new delirium patients were discussed, and their colleagues were informed about the patient status and details of the course of treatment. Also, the data in this form includes the financial database professional billing data. Postoperative cost - laboratory (blood tests) of patients, radiology, intensive care stay days, intensive care bed use and maintenance expenses, technical cost information for clinical care expenses, doctor and nurse monitoring forms, data of the hospital billing unit taken using.

Ethical Consideration

This study was approved by the Institutional Review Board of the X University (Approvalno: 3517/2018) and work permit from the management of the hospital were obtained. After the participation was stated on a voluntary basis, written and oral informed consent of the participants was obtained.

Evaluation of the Data

IBM SPSS 25.0 (SPSS Inc., Chicago, IL, USA) package program was used to evaluate the data. Firstly, Kolmogorov-Smirnov, Shapiro Wilk-W test was performed to determine whether the data showed normal distribution and the normal distribution of the data was examined. In the results obtained, it was determined that the level of significance was $p<0.05$ and the data were not normally distributed. In the literature, if $p<0.05$, it indicates that the data are not normally distributed. According to these results, non-parametric tests were applied. In comparison of quantitative data, Mann-Whitney U test was used between two independent groups where the data was numerical, Kruskal-Wallis test between two independent groups where the data was numerical, Chi or two independent test, and multiple regression analysis. Results were evaluated at 95% confidence interval and $p <0.05$ significance level.

3 RESULTS

Evaluation of Delirium Incidence and Delirium Development After Surgical Intervention

As a result of the evaluation made according to the Nursing Delirium Screening Scale (Nu-DESC) scale scores before and after the surgical intervention, it was observed that there was a difference in delirium development rates. While delirium developed in 25% of the patients ($n = 28$), delirium did not develop in 75% of the patients ($n = 84$). This difference was statistically significant ($\chi^2 = .50$, $p = 0.000 < 0.05$). The total incidence was determined to be 25 percent (Table 1).

When delirium development day is evaluated in the patients in the study; It was determined that delirium developed more on the first day after surgery, no new delirium was observed after the third day after surgery and the difference was found statistically significant ($p <0.05$). When
the delirium types were evaluated, hypoactive delirium (2 points) in 20 patients, hyperactive delirium in 5 patients (3 points), and mixed delirium in 3 patients (4 points and above) were detected in the total of both groups. It was found that there was 1 patient who switched from hypoactive delirium to mixed delirium (Table 2).

Table 2. Days and types of delirium seen after surgery

<table>
<thead>
<tr>
<th>Days and Types of Delirium</th>
<th>There is delirium (n = 28)</th>
<th>Total Number S</th>
<th>K-S test outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Day After Surgery</td>
<td>20.5, 3</td>
<td>25 (82)</td>
<td>3500 0.000</td>
</tr>
<tr>
<td>Hyperactive, Mix</td>
<td>12.0, 4</td>
<td>17 (19)</td>
<td></td>
</tr>
<tr>
<td>2nd Day After Surgery</td>
<td>(24,6,8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyperactive, Mix</td>
<td>14.0,3</td>
<td>17 (19)</td>
<td></td>
</tr>
<tr>
<td>3rd Day After Surgery</td>
<td>(28,0,8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Delirium types in Nursing Delirium Screening Scale (NuDESC) scoring: 0-1 point = no delirium, 2 points = hypoactive delirium, 3 points and above = hyperactive delirium, 4 points and above = mixed delirium

Comparison of Risk Factors After Surgical Intervention in Patients with and without Delirium

When the results of $c^2$, t, and Mann-Whitney U, Kolmogorov Smirnov tests performed to determine whether the values of the risk factors after the surgical intervention of the patients included in the study differ according to their delirium development status (Table 3), patients who developed or did not develop delirium. There was a significant difference between the presence of medication, gender, chronic disease, and the presence of patients with diabetes and hypertension, the number of days hospitalized (p < 0.05).

The average age of patients with delirium occurred and the patient group was 72.7 ± 2.5, while in developing delirium group 75.8 ± 5.7 was found to be. Although the majority of the patients were men, 64% of the patients who developed delirium were men. When the educational situation was evaluated, it was determined that both groups showed similarities. It was determined that all of the patients who developed delirium had a chronic condition and these diseases were diabetes and hypertension, and all of them had medication that they used continuously. In addition, a significant difference was found between the patients who developed delirium and those who did not. The average number of days of stay in patients with delirium was high (Table 3).

There was a significant difference between direct and indirect costs of patients who were included in the study and who developed delirium after surgery compared to patients without delirium. The number of days in the hospital was higher than 4 days and during these 4 days, daily care, medicine, radiology and blood tests, intensive care. When the expenditures for the stay were evaluated in dollar terms, it was found that those who did not develop delirium were higher (Table 4).

4 DISCUSSION

Although this research is preventable, it was carried out to determine the costs caused by the development of delirium, which is seen as a prevalent medical complication after surgery in elderly patients. For this purpose, by investigating the modulator effect of risk factors in surgical processes and their relationship with delirium, "H1; There is a difference between the costs spent for patients with and without delirium after surgery. "Hypotheses were confirmed. In the study, the incidence of delirium was found to be 25%. What does a delirium patient cost? The retrospective data analysis shows that hyperactive delirium patients are expensive. According to the available data, an additional cost of approximately $2,326.96 per diagnosed delirium patient must be taken into account.

Although the type of surgical intervention performed is different, both the incidence and prevalence of delirium are higher in elderly patients compared to other patient groups, especially after cardiovascular surgery and orthopedic surgery. Also, it affects elderly patients and their relatives negatively, emotionally, and functionally. These effects are; Prolonged hospitalization, mortality, morbidity, and hospital costs increase (Eijk and Slooter 2010, Banerjee et al. 2010). Therefore, evidence-based studies are needed to prevent delirium. The basic principle in health care is to prevent diseases, to predict medical problems and complications in advance, and to take precautions. The forecasting preven prevention approach in healthcare, which requires a multidisciplinary approach, is expected from healthcare professionals. Within the scope of this expectation and responsibility, the role and responsibilities of nurses in the prevention, care, and treatment of delirium seen after surgery are important for value-based care. These roles and responsibilities of nurses help early diagnosis of delirium and contribute to the healing process. Pharmacological interventions to prevent delirium development are not yet fully available, but it is a priority for healthcare professionals to conduct evidence-based studies (Champell 2009).

Various risk factors at each stage of the surgical process can affect the development of delirium after surgery. Particularly, individual characteristics and medical history

Table 3. Comparison of delirium development status of patients with risk factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Delirium</th>
<th>No</th>
<th>There</th>
<th>PA</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Factors for Delirium</td>
<td>Delirium</td>
<td>is</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Before Surgical Intervention</td>
<td>ium (n)</td>
<td>(84)</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Age</td>
<td>(&lt; 2)</td>
<td>= 28</td>
<td>U /</td>
<td>≥ 2</td>
<td>t</td>
</tr>
<tr>
<td>Gender</td>
<td>n%</td>
<td></td>
<td></td>
<td>n%</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>26 (31)</td>
<td>10 (36)</td>
<td>0.022</td>
<td>16.52</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>58 (69)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td>)</td>
</tr>
<tr>
<td>Education</td>
<td>25 (30)</td>
<td>4 (14)</td>
<td>0.475</td>
<td>0.288</td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>43 (52)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td>)</td>
</tr>
<tr>
<td>Primary education</td>
<td>4 (5)</td>
<td>12 (43)</td>
<td>)</td>
<td>)</td>
<td>)</td>
</tr>
<tr>
<td>High school</td>
<td>5 (6)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td>)</td>
</tr>
<tr>
<td>High education</td>
<td>7 (7)</td>
<td>12 (43)</td>
<td>)</td>
<td>)</td>
<td>)</td>
</tr>
<tr>
<td>Marital Status</td>
<td>79 (94)</td>
<td>28</td>
<td>0.514</td>
<td>0.0712</td>
<td></td>
</tr>
<tr>
<td>The married</td>
<td>5 (6)</td>
<td>)</td>
<td>)</td>
<td>(100)</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>0 (0)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Chronic Disease</td>
<td>3 (6)</td>
<td>43</td>
<td>28</td>
<td>0.048</td>
<td>12.68</td>
</tr>
<tr>
<td>There is (%)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>None (%)</td>
<td>48 (57)</td>
<td>0 (0)</td>
<td>0.028</td>
<td>11.26</td>
<td></td>
</tr>
<tr>
<td>Chronic Disease</td>
<td>25 (32)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>19 (23)</td>
<td>0 (0)</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>18 (22)</td>
<td>28</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>Diabetes and Hypertension</td>
<td>9 (10)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>COPD</td>
<td>11 (13)</td>
<td>0</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>Other (Urinary system, GIS, Musculoskeletal system)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking Habits</td>
<td>26 (31)</td>
<td>7 (25)</td>
<td>0.133</td>
<td>0.0782</td>
<td></td>
</tr>
<tr>
<td>There is (%)</td>
<td>58 (69)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>None (%)</td>
<td>21 (25)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>Alcohol Use</td>
<td>7 (8)</td>
<td>6 (21)</td>
<td>0.848</td>
<td>0.0400</td>
<td></td>
</tr>
<tr>
<td>There is (%)</td>
<td>77 (92)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>None (%)</td>
<td>22 (79)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>Continuously Used</td>
<td>34 (40)</td>
<td>28</td>
<td>0.0</td>
<td>15.13</td>
<td></td>
</tr>
<tr>
<td>Medicine</td>
<td>50 (60)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>There is (%)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>None (%)</td>
<td>0 (0)</td>
<td>)</td>
<td>)</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>Drug Usage Time (Year)</td>
<td>6.2 ±</td>
<td>10.09</td>
<td>0.032</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Number of days hospitalized</td>
<td>0.2</td>
<td>± 4.9</td>
<td>3795</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of days hospitalized</td>
<td>4.2 ±</td>
<td>9.09</td>
<td>0.02</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Pearson’s chi-square test for Katogorik variables, katogorik variable iste the normal distribution and the observed variable <5 cells having less than Kolmogorov-Smirnov test for X² tables, non kato-
gorik and normal mountain i t i show the two variants for Mann Whitney U non katogorik and normal mountain Student t test was studied for two variables showing 1 . Significance was evalu-
ated at the level of p<0.05

Table 4. The Cost of Delirium in the Surgical Patient, in dollars

<table>
<thead>
<tr>
<th></th>
<th>Delirium</th>
<th>Non Delirium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care (24)</td>
<td>128 $</td>
<td>260 min or</td>
</tr>
<tr>
<td>$/h daily</td>
<td>4 h</td>
<td>108 $ (215 min</td>
</tr>
<tr>
<td>Physicians</td>
<td>56 $ (30 %)</td>
<td>(66 )</td>
</tr>
<tr>
<td>(43 $ /h)</td>
<td>min or 1 h</td>
<td>66</td>
</tr>
<tr>
<td>Medication/</td>
<td>28.24 $</td>
<td>15.10</td>
</tr>
<tr>
<td>daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiology/</td>
<td>112$</td>
<td>-</td>
</tr>
<tr>
<td>daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensive</td>
<td>110$</td>
<td>85$</td>
</tr>
<tr>
<td>Care Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood tests</td>
<td>60$</td>
<td>34$</td>
</tr>
<tr>
<td>/daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total/ daily</td>
<td>382.24 $</td>
<td>298.10 $</td>
</tr>
<tr>
<td>Total payment</td>
<td>1,528.96 $</td>
<td>560</td>
</tr>
<tr>
<td>for additional</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>diagnosis after</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>surgery (4 days)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct</td>
<td>1,528.96</td>
<td>560</td>
</tr>
<tr>
<td>costs/$</td>
<td>798.02±</td>
<td>226</td>
</tr>
<tr>
<td>Indirect</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>costs/$</td>
<td>798.02±</td>
<td>226</td>
</tr>
<tr>
<td>Total cost/$</td>
<td>2,326.96±</td>
<td>786</td>
</tr>
<tr>
<td></td>
<td>0.042</td>
<td></td>
</tr>
</tbody>
</table>

Tables reported in this table represent mean SD. Of financial data for patients who underwent a broad range of elective surgical procedures during the study.

are among the most important risk factors before surgery. Among these risk factors; age, gender, educational status, marital status, medical diagnosis, chronic diseases of the patient, vision and hearing problems, presence of a urinary catheter, problems with bowel emptying, inactivity, sleep patterns, and multiple and risky drug use are included (Chow, Rosenthal et al. 2012, Inouye et al. 2015, Oh et al. 2015, Scholz et al. 2016, Gossett et al., 2015, Raats et al. 2015, DeWitt, 2018). When delirium development day is evaluated in the patients in the study; In both groups, it was determined that delirium developed more on the first post-operative day, and no new delirium was observed after the third postoperative day, and the difference was statistically significant (p <0.05). When the delirium types were evaluated, hypoactive delirium (2 points) in 20 patients, hyperactive delirium in 5 patients (3 points), and mixed delirium in 3 patients (4 points) were found in the total of both groups. It found that there was one patient who switched from hypoactive delirium to musk delirium. Lin et al. According to the (2015) study, the most common type of delirium; is a mixed type with 47.05%, followed by hypoactive delirium with 38.24%.

Höltta et al. (12) In the study of the risks that trigger delirium in patients over 70 years of age; The most common hypoactive (48.4%) and mixed type (23.2%) delirium were observed in patients. According to a systematic review, 2011 is the most common delirium type mix (55 per-
cent) and hypoactive (46 percent) delirium (Cerejeira and Mukatov-Ladinska 2011). In another study with delirium patients consulted to the consultation season unit, delirium was the most common hyperactive type (50 percent) in pa-
tients (Grover et al. 2015). In this situation; In clinics, patients with hypoactive delirium are accepted as “compatible

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Among the limitations of our study is an unsuccessful attempt to separate the effects of important determinants of hospital costs from the development of postoperative delirium.

Although these efforts at multiple regression analysis may have been limited by power rather than the true absence of an effect, further investigation will be necessary to establish this association more definitively. Secondly, the conclusions of our study may not be applicable to hospitals with dissimilar characteristics such as surgical volume, incorporation of care paths into inpatient nursing care, or routine use of preoperative evaluation and medical status optimization. It is important to note that overall costs in a tertiary-care hospital setting were not significantly higher for patients with delirium, although this might not be true for smaller general hospitals offering fewer services or performing fewer procedures. It is possible, for example, that patient volume at our institution may have resulted in a course of treatment that involved fewer costly interventions and greater efficiency.

5 CONCLUSION AND RECOMMENDATIONS

Based on these results These limitations notwithstanding, our study supports many others in identifying increased LOS for patients with delirium. Furthermore, we have demonstrated that it is possible to identify where increased costs occur. Recognizing patient characteristics reflecting vulnerability to a cute cognitive impairment (such as diminished preoperative functional and cognitive status) and the cautious use of postoperative interventions (such as multiple medications, restraints, or indwelling bladder catheters that may precipitate delirium) may reduce the risk of delirium and its financial impact on selected hospital systems. Early psychiatric-psychosocial intervention may also play an especially pivotal role in reducing risk for postoperative delirium. Although future interventions directed at modifying risks for delirium may be designed to improve clinical outcomes and lower complication rates, our study suggests they may also result in substantially reduced health care costs as well.

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