Original Research Article

The importance of postoperative delirium (POD) on elderly patients in urology in increasing the day stay in hospital.

Abstract:-

Introduction & objectives: The Postoperative delirium on elderly patients (P.O.D.) is a frequent post operative disorder to the sick and elderly patients, and always has been associated with prolongation of day stay in hospital, and certainly more cost for the hospital as well. The Postoperative delirium on elderly patients (P.O.D.) causes an increased mortality and an increasing of mental status deterioration characterized by reduction of environmental recognition as well as the disorder of alertness.

This study is accomplished by Anesthesiology and Intensive Therapy Service of the Urology Clinic of the University Hospital Center `Mother Theresa`, Tirana, Albania.

The purpose of this study is revealing of the importance of Postoperative delirium on elderly patients (POD) admitted in Urologic Clinic, and impact of this complication on the day stay in hospital.

Materials & methods: In this study are included 1496 patients aged over 65 years who underwent an operation at the urologic clinic. Period of study: from January 2010 to December 2012.

This study is prospective and random. All patients with psychological problems in admission and that were treated for these pathologies before admission in Urology Clinic are excluded from the study.

The effectiveness of routine screening of Postoperative Delirium in the elderly patients (POD) using Confusion Assessment Method (CAM) from Psychiatrists, were been not necessary in these cases.

Results: Are evaluated all the data taken from patients and from their examinations as: age, usage of medications, symptoms, biochemical analysis, clinical balance, hemodynamic examinations, and preoperative, intra operative and postoperative evaluations.

In 1496 patients, 270 of them ( 18%) had of Postoperative Delirium in the elderly patients (POD). On the average, the patients with delirium stayed in the hospital more than the patients without delirium with a significant statistical difference between them t=5.12 p<0.01..

On the average, the patients with of Postoperative Delirium in the elderly patients (POD), stayed in the hospital more than the patients without delirium with a significant statistical difference between them ANOVA F=26.2 P<0.01.

Conclusion: From this study, even though small in number and short in time, it is evidently noticed that Postoperative Delirium (POD) in the elderly patients in urology has an important influence in the prolongation of the day stay in hospital. (ANOVA F=26.2 P<0.01.)

Key word: POD, CAM,
**Introduction:** Increasing numbers of elderly patients are undergoing an increasing variety of surgical procedures [1].

Effects of aging on the nervous system include: selective atrophy of cerebral and cerebellar cortical neurons, neuron loss within certain areas of the thalamus, locus ceruleus, and basal ganglia of the brain, general reduction in neuron density, with loss of 30% of brain mass by age 80, decreased number of serotonin receptors in the cortex, reduced levels of acetylcholine and acetylcholine receptors in several regions of the brain, decreased levels of dopamine in the neostriatum and substantia nigra of brain, and reduced numbers of dopamine receptors in the neostriatum part of brain, as well. The association of serotonergic, cholinergic, and dopaminergic systems, respectively with mood, memory, and motor function, may partially account for depression, loss of memory and motor dysfunction in the elderly.

With the increase of the life span of the patients, the urologic surgeries in these group of elderly patients are also increased. The surgery plays an important role on emotional and spiritual deteriation on elderly patients. According to the American Psychiatric Association, Delirium is defined as "a disturbance of consciousness with the reduction of the ability to focus, sustain, or change in focus, a change in the recognition (memory deficit, disorientation, spoken of untidiness), or the development of perception mess.

Specific Postoperative Complications of the elderly surgical patients such as delirium will be increasingly relevant in the coming decades. The prevalence of post-operative delirium in elderly patients (POD) ranges from 0% to 73%, depending on the study and type of surgery [3]. Post-operative delirium is a medical emergency, which can occur within hours of surgery and has the potential to last up to 7 days [4]. At least a quarter of elderly patients who develop delirium post-operatively in the elderly patients (POD), may continue to have symptoms for up to 6 months after hospital discharge [5]. Delirium postoperative in the elderly patients (POD) has been associated with increased morbidity and mortality and prolonging of day stay in urology clinic. With increase of the life span, the urologic surgery in the elderly patients is increasing as well.

**Pathogenesis.** The reasons of Delirium postoperatively to elderly patients (POD) are multifactorial. Many theories emphasize aberrant neurotransmission. Other hypotheses invoke abnormalities in melatonin, serotonin, [6,7] and abnormal tryptophan metabolism. Because of tryptophan causes Neuronal damaging, that is an alternative explanation, secondary either to oxidative stress [8], or inflammation. Proinflammatory cytokines increase in postoperative delirium, [10] especially interleukin-6 and interleukin-8 [9]. In addition, elevations in C-reactive protein occur in delirious patients. A link between inflammation and neurotransmission has been proposed, with inflammation-induced perivascular edema leading to hypoxia and subsequent reduced synthesis of acetylcholine [11]. It is generally thought that delirium represents global brain dysfunction. Electroencephalographic findings (EEG), reveals a decreasing of the fast alpha frequencies and an increasing in the slower theta rhythm.
In hypoactive delirium, hypoperfusion occurs globally in the frontal, temporal, and occipital lobes, and focally in the caudate head, thalamus, and lenticular nuclei of the Brain. Delirium can be improved, once blood flow returns to normal, suggesting that cerebral hypoperfusion may play a role. One of the most widely accepted mechanisms, are cholinergic deficiency, and increased serum anticholinergic activity. Both of them are associated with delirium. The function capacity of organs deteriorates, resulting in decreased capability to overcome surgical stress. As a result, the elderly surgical patients have higher rates of peri-operative morbidity and mortality. Anesthesia and peri-operative care should be customized to this population. Practicing management of older patients undergoing surgery will increase the experience of all caregivers and, in time, improve outcome. Postoperative delirium is common, but underdiagnosed, in elderly surgical patients, and delays rehabilitation. Multimodal intervention strategies are recommended for preventing postoperative delirium. Excessive anaesthetic depth is implicated in the mechanism of haemodynamic compromise, has been associated with myocardial infarction and stroke, postoperative delirium and, when combined with hypotension and low inspired anaesthetic concentration, increased mortality.

Purposes of this study are to reveal the importance of postoperative Delirium in the elderly patients (POD) and prolongation of the the day stay in hospital.

**Materials & methods:** In this study are included 1496 patients aged over 65 years who underwent an operation at the urologic clinic. Period of study: from January 2010 to December 2012. Pt with Insult cerebral, Alzhemimers, phsicosa, parkinson, are excluded from the study. The effectiveness of routine screening of postoperative Delirium (POD) in the elderly using Confusion Assessment Method (CAM). Psychiatrists are not necessary in this case. This study is prospective and random. This study is accomplished by Anesthesiology and Reanimation Service of the Urology Clinic of the University Hospital Center `Mother Theresa`, Tirana, Albania. Some Anesthesiologists has completed preoperative and intraoperative data but did has no idea of Study. These data are opened only at the end of the study by team in charge of the study composed by other Anesthesiologists and Reanimators. The Team in Charge of the study have collected and other data about incidence of acute postoperative complications to the elderly patients. Cognition is made with evaluation of MMSE, 24 hour preoperative data from one Anesthesiologist not included in the Team in charge of study. Patients with less than 23 points, are not included in this study.

Elderly patients included on the study are monitored pre, intra, and post operative period with monitoring of Blood pressure, cardiac frequencies, ECG, pulse-oxymeter. Monitoring has been non-invasive, and some of them are monitored invasively and central venos cateter as cistectomy. Patients that underwent cystectomy operations are made with Endotracheal General Anesthesia and epidural anaestheasia. Induction Anesthesia with: Fentanyl, Tiopental. Intubation with Suxamethonium. Maintenance Anesthesia with: Fentanyl + Pancuronium + O2 + Halothan, Sevofluran, or Isofluran.
Other Patients were made with Spinal Anesthesia or Peridural Anesthesia, with needle G 25, intruded between L2-L3. As anesthetics, are used Bupivacine 0.5% -3ml (15mg), and/or Morphine 200 ug (microgram).

MAP and cardiac frequency are maintained ≤ 20% of normal values. In cases of increasing of normal values above 20%, then we have deepening anesthesia with bolus of fentanyl.

In cases of problems as temporary Hipotension or bradycardia, then are maintained with adrenaline, Atropine and liquids.

With finishing of the operation, are interrupted i/v and inhalator anesthetics. Patients are maintained with oxygen mixed with air 50%-50% and have been de-curarized with Prozerine 2.5mg accompanied with Atropine 1mg diluted with physiologic solution and injected slowly i/v.

**Statistical Analysis and Results.** In this study, 488 cases of group patients of age 65-70 years, 375 (76.8%) of patients underwent Spinal Anesthesia; 108 (or 22.1%) of patients are underwent General Anesthesia with Intubation; and 5 (or 1%) of patients are underwent local Anesthesia.

Is observed that from 424 cases of age 71-75 years, 271 (or 63.9%) of patients are underwent Spinal Anesthesia; 148 (or 34.9%) of patients are underwent General Anesthesia with Intubation; and 5 (1.2%) of patients underwent local Anesthesia.

Is observed that from 402 cases of age 76-80 years, 260 (or 64%) of patients are underwent Spinal Anesthesia; 142 (or 35.3%) of patients are underwent General Anesthesia with Intubation, and 5 (1.2%) of patients are underwent local Anesthesia.

Is observed that from 182 cases of age above 80 years, 125 (or 68.7%) of patients are underwent Spinal Anesthesia; 57 (or 31.3%) of patients are underwent General Anesthesia with Intubation, and no one is maintained with local Anesthesia.

**Table.** Patients maintained with different Anesthesia divided in male and female

<table>
<thead>
<tr>
<th>Type of Anesthesia</th>
<th>Female</th>
<th>Male</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal</td>
<td>69 (40.1%)</td>
<td>997 (75.3%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Endotracheal</td>
<td>93 (54.1%)</td>
<td>362 (27.3%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Local</td>
<td>10 (5.8%)</td>
<td>0</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
The patients’ days stay in hospital are analyzed, taking in consideration whether they have had postoperative delirium or not.

Patients of the study, have had no difference between them concerning: the type of surgery, pre-existing diseases, hemodynamic intraoperative changes, biochemical balances, and the blood framework, as well as the pre and postoperative electrolytic balance.

Table. General Data.

<table>
<thead>
<tr>
<th>Year</th>
<th>Age</th>
<th>65-70 years</th>
<th>71-75 years</th>
<th>76-80 years</th>
<th>&gt;80 years</th>
<th>Total number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>Females</td>
<td>36</td>
<td>22</td>
<td>19</td>
<td>6</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>162</td>
<td>138</td>
<td>133</td>
<td>56</td>
<td>489</td>
</tr>
<tr>
<td>2011</td>
<td>Females</td>
<td>20</td>
<td>12</td>
<td>10</td>
<td>8</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>148</td>
<td>149</td>
<td>147</td>
<td>50</td>
<td>494</td>
</tr>
<tr>
<td>2012</td>
<td>Females</td>
<td>15</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>142</td>
<td>80</td>
<td>78</td>
<td>41</td>
<td>341</td>
</tr>
</tbody>
</table>
### 2010

- **65-70 years**: Total number of Patients (100%)
- **71-75 years**: Total number of Patients (100%)
- **76-80 years**: Total number of Patients (100%)
- **above 80 years**: Total number of Patients (100%)

#### By Gender:
- **Female**: Blue bars
- **Male**: Red bars

### 2011

- **65-70 years**: Total number of Patients (100%)
- **71-75 years**: Total number of Patients (100%)
- **76-80 years**: Total number of Patients (100%)
- **above 80 years**: Total number of Patients (100%)

#### By Gender:
- **Female**: Blue bars
- **Male**: Red bars
Table. Elderly Patients with Post-operatively Delirium Incidence.

<table>
<thead>
<tr>
<th>age</th>
<th>Female</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-70 years</td>
<td>1</td>
<td>76</td>
<td>77</td>
</tr>
<tr>
<td>71-75 years</td>
<td>1</td>
<td>73</td>
<td>74</td>
</tr>
<tr>
<td>76-80 years</td>
<td>1</td>
<td>70</td>
<td>71</td>
</tr>
<tr>
<td>&gt;80 years</td>
<td>1</td>
<td>47</td>
<td>48</td>
</tr>
</tbody>
</table>
Fig. Average day stay in hospital for Elderly Patients with Post-operatively Delirium and Elderly patients without Post-operatively Delirium
Elderly Patients with Post-operatively Delirium have stayed in average longer in the hospital, compared to patients with no delirium, with a significant statistical difference between them of $t = 5.12$, and $p < 0.01$.

**Fig.** Average day stay in hospital for Elderly Patients with Post-operatively Delirium and Elderly Patients without Post-operatively Delirium through the years.
If these results are observed more in particulars we can analyse than:

- during 2010, the average day stay of patients was 9.22 days, while patients with delirium stayed for about 10.1 days.
- during 2011, the average day stay was 9.2 days. Patients with delirium stayed for about 10.0 days.
- during 2012, the average day stay was 8.25 days, and patients with delirium stayed for about 9.3 days.

In these three years, elderly patients with postoperative delirium, stayed in average longer in the hospital than patients without postoperative delirium, with a significant statistical difference between them ANOVA F=26.2 P<0.01.

**Discussions:**

Early postoperative delirium is a problem[^18], not only for welfare patients during surgery, but and for prolongation of day stay of patient in hospital, and is also a predisposing factor that these patients have post operative delirium, even after being discharged from the hospital. Cognitive postoperative deterioration, is a general and important problem in elderly patients, after cardiac and non cardiac surgery.
As a general summary, Authors also note that patients with postoperative delirium, have a tendency to increase their day stay in hospital, compared to patients with no post operative delirium with the same preoperative and intraoperative physical status, who undergo the same type of surgery and anaesthesia.

The role of postoperative analgesia in improving of health conditions is seen during first postoperative day because a patient who is not fully responsible, because some of them can rip off their own intravenous catheter, or urinary catheter, and sometimes and the central venous catheter as well. Those actions can have their own negative results in the performance of the disease.

Conclusion:

Elderly Patients with postoperative delirium, had a longer day stay in hospital compared to elderly patients without postoperative delirium, despite the same conditions such as morbidity and physical status, with a significant statistical difference between them ANOVA F=26.2 P<0.01.

A part of elderly patients underwent urologic surgery, during postoperative period have Postoperative Delirium. All elderly patients with post operative delirium must have a intensive medical care during postoperative period.

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