

CONFLICT OF INTEREST: NONE DECLARED

## ORIGINAL PAPER

# Mortality Among Third Age Patients with Hip Fracture and High Cardiac Risk

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**Introduction:** Mortality after hip fracture remains high in spite of the progress of medicine.

Due to the trend toward longer life, the problem of hip fracture is getting more significant. **The aim** of this study is to determine the effects of surgical treatment in patients with high risk of hip fracture on mortality reduction. **Methods:** In the retrospective-prospective study, 66 patients aged 65-92 with a hip fracture and a high cardiac risk have been analyzed. The risk estimation was based on the Lee index. The patients with three or more risk factors were considered high-risk. The first group consisted of surgically treated patients with a hip fracture and at high cardiac risk, and in the second group were conservatively treated patients with a hip fracture and high cardiac risk. **Results:** In the group of conservatively treated patients, 75% were women and in operatively treated group 67.6%. Patient in both group are similar in relation to the participation of risk factor. A difference has been noticed in terms of renal insufficiency (RI). There was 18.8% conservatively treated patient with RI and 2.9% in operatively treated group. **Conclusion:** Patients with hip fracture and at high cardiac risk have lower mortality when treated surgically. **Key words:** preoperative risk, hip fracture, mortality.

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## 1. INTRODUCTION

Mortality after hip fracture remains high in spite of the progress of medicine (1, 2, 3). Due to the trend toward longer life, the old people population is the fastest growing age group. Simultaneously with population aging, the problem of hip fracture is getting more significant. Population aging leads to increased incidence of osteoporosis and atherosclerosis and thus more frequent hip fractures associated with heart disease, diabetes, cerebral and renal insufficiency. The standard treatment of hip fractures is operative unless there are contraindications because of comorbidity. Conservative treatment is synonymous with long-term immobi-

lization and the complication occurring and thus mortality. Mortality rate depends on the criteria for operation. If the criteria are stricter, mortality is lower, and vice versa. A significant decrease in mortality cannot be expected in spite of medical progress in general and particularly technical progress of operations. The reason for this prognosis is the same phenomenon – medical progress since it leads toward longer life of population which means that higher number of older people with more risk factors of mortality will be operated. A number of studies on choice of treatment for high-risk patients and severe comorbidity have been published. However, there is no unique algorithm

for optimal treatment of high-risk patients which results in individual differences in treatment selection. Generally, recommendations are that surgeons, according to their own experience, should estimate if conservative or operative treatment is more beneficial for the certain patient (3).

## 2. MATERIAL AND METHODS

A retrospective-prospective study included patients with hip fracture at the Clinic of Orthopedic Clinical Centre of University of Sarajevo from January 1, 2011 to March 1, 2012. The study included 66 patients at high cardiovascular risk aged 65–92. We included only those patients who were 65 years or older and who had three or more comorbid risk factor (chronic heart failure, previous myocardial infarction or angina pectoris, insulin dependent diabetes mellitus, previous cerebrovascular insult or transitory ischemic attack and renal insufficiency with creatinine level 170 mmol/l or high).

Patients were divided into two groups: the first group included 34 patients with hip fracture and high cardiovascular risk who had been treated operatively. The second group included 32 patients with hip fracture and high cardiovascular risk who had been treated conservatively. The exclusion criteria on patient selection were those patients with metastatic pathological

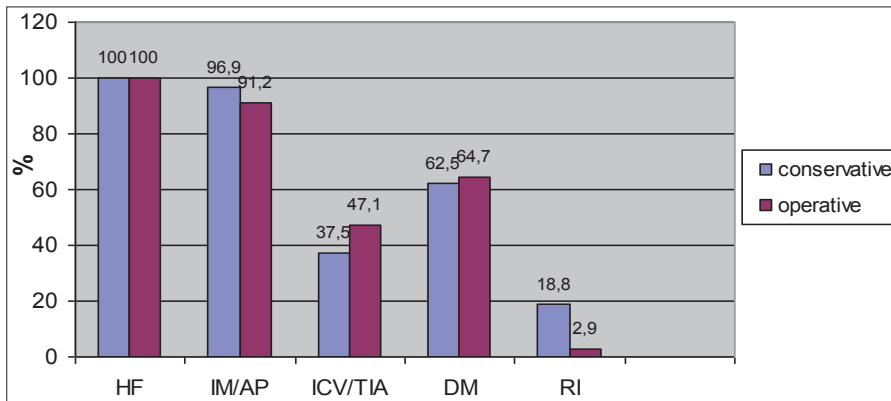


Figure 1. Percentile representation of risk factors

fracture as well as patients who were treated conservatively because they refused operative treatment although they did not have cardiovascular risk. Procedures for patient's examination included anamnesis, objective physical examination, electrocardiogram (ECG), X-ray of thoracic organs and laboratory analysis.

Hip surgery is intermediate risk surgery.

### 3. RESULTS

Analysis gender distribution compared to type of treatment shows that both groups have more women (75% in conservative and 67,6% in operative group). There is no statistically significant difference in gender distribution in terms of the type of treatment (Figure 1).

Patients in both group are similar in terms of the presence of risk factors. Review of risk factors between two groups did not show statistically significant difference between them. Statistically significant difference is noticed in case of renal insufficiency (RI). There was 18,8% conservatively treated patients suffering from this disease comparing to 2,9% operatively treated patients ( $p < 0,05$ ).

For that reason, we compared percentage participation RI on mortality. Analysis of RI on mortality shows that RI was similarly frequent among patients who died (11,5%) and those who survived (10%) without statistically significant difference ( $p > 0,05$ ) (Figure 2).

Comparing type of fracture with type of treatment shows that in conservatively treated patients, fractures neck of femur are dominant (50 %), followed by intertrochanteric (43,7%)

while the subtrochanteric fracture occurred in 6,3% patients. In operatively treated group, 61,8% patients had intertrochanteric fracture, subtrochanteric 32,4% and fracture neck of femur only 5,8%. Statistically significant analysis by Chi-square test shows statistically significant difference between fracture types and treatment types ( $p < 0,05$ ).

Mortality is more frequent among patients treated conservatively (56,3%) compared to those treated operatively (23,5%) which make statistically significant difference ( $p < 0,05$ ).

After one month, mortality in the conservatively treated group was 21,9%, and in the operatively treated group 14,7%. In the following five months, mortality in the first group was 34,4% and in the second group only 8,8%.

### 4. DISCUSSION

In our study, there were 71,2 % women and 28,8% men. During the period from January 1, 2011 to March 1, 2012, we identified 66 high cardiac risk patients with hip fracture in Clinic of Orthopedics at Clinical Centre Sarajevo. Due to high cardiac risk, 32 patients were treated conservatively while 34 were treated operatively. The

average age was  $78.52 \pm 5.46$  years (65-92). They were the same in terms of age and risk factors. In both group, most patients had three risk factors. Patients were different in terms of treatment type. There was 50% of patients with fracture neck of femur, and only 6,3% patients with subtrochanteric fracture in conservatively treated group. In operatively treated group, most patients had intertrochanteric fracture (61,8 %), then subtrochanteric (32,4 %) and the lowest percentage of them had fracture neck of femur (5,9%).

This data correspond with the recommendations that intracapsular non-dislocated fracture neck of femur can be treated conservatively in case of poor condition.

Cochrane's review of results of operative compared to conservative treatment did not give clear guide for selec-

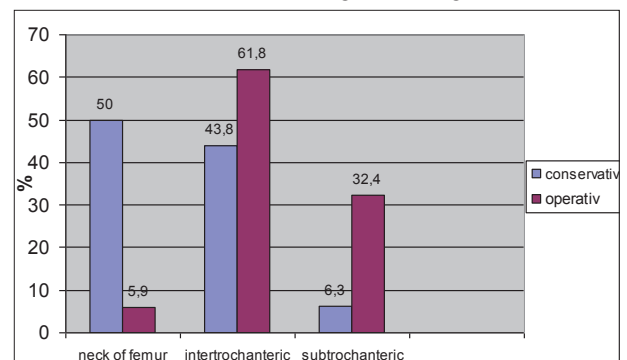


Figure 2. Correlation between type of fracture and type of treatment

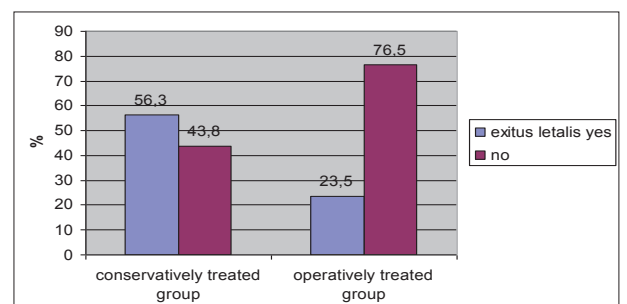


Figure 3. Mortality compared with treatment type

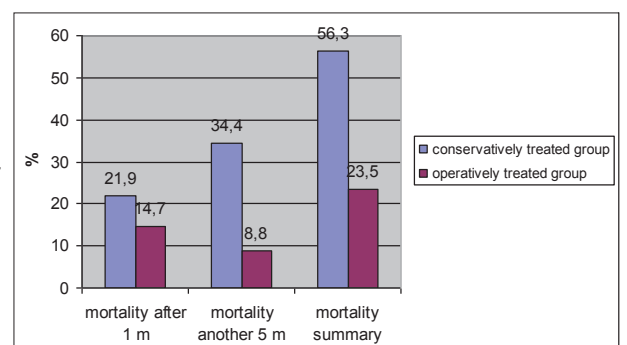


Figure 4. Mortality rate in the total sample after 1 and 6 months

tion of treatment. Thus, he suggested physicians to estimate individually which treatment would be most suitable for certain patient based on analysis of surgical feasibility compared to conservative treatment (4). Our study shows that mortality after one month in conservatively treated group (21%) was higher than in operatively treated group (14.7%). These results are similar to the results of the study by Jain R. et al. They found that mortality in conservatively treated patients (18.8%) were higher than in operatively treated group (11%) after one month (5).

For operatively treated group, mortality is the highest in the first month after treatment. For conservatively treated group, the risk increases over time. In our study, mortality in conservatively treated group after six months was 56.3%. This data correspond with the results of study of Ions and Stevens which showed that mortality among conservatively treated patients with hip fracture was 60.8% six months after treatment (6).

Hornby et al. did not find statistically significant difference in mortality after the same period of time. The conclusion of recent studies is that conservative treatment followed by early mobilization can be alternative to surgery. The focus is on early mobilization in those situations in which a good quality conservative treatment that includes early mobilization has no significant difference in the outcome of operative compared to conservative treatment. Study by Parker et al. showed that conservative treatment is more expensive (6000 pound/patient) compared to operative treatment (3446 pound/patient) (7). Our study did not research costs

of the treatments due to the practice of discharging patients to recovery at home after the decision on conservative treatment. These results can indicate that investments are lower and health surveillance is weaker in the group of patients treated conservatively which therefore can be the cause of worse results of conservative treatment comparing to studies conducted in developed countries.

The cause of the increased mortality in the group of conservatively treated patients can be the result of prolonged immobilization, poor medical supervision and a lower financial investment in this group. Mortality in operatively treated group was statistically significantly lower compared to those treated conservatively.

## 5. CONCLUSION

None risk factor have statistically significantly greater impact on the outcome of treatment in relation to other risk factors. Operative treatment had statistically significant better influence on motility after injury. Mortality among operatively treated patients was statistically significantly lower than among conservatively treated patients.

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