

# Geriatric Trauma in Orthopaedics: Need for a Multidisciplinary Approach

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**Abstract:** Geriatric fractures represent an increasing burden world over for the medical fraternity. Though India is considered to be a country of young people, the number of geriatric population is also very high in terms of sheer number of people who constitute this age profile. There is a strong need to understand the intricacies of managing the orthopaedic injuries in this age group and develop a standard protocol to follow in our country. These protocols need to be useful not only in management of these injuries but also in their prevention. In house multidisciplinary approach and integrated evaluation of these fractures can assist in improving the ultimate outcome in these fractures.

## INTRODUCTION

Geriatric trauma patients are the fastest growing segment of patients admitted to trauma centre<sup>1</sup>. Geriatric trauma patients have higher rates of mortality and morbidity as compared to younger patients with comparable degrees of injury<sup>2-4</sup>. As the population ages and life expectancy increases, the number of elderly patients presenting with trauma will continue to rise. The aging population will continue to place a huge demand on healthcare resources, particularly in orthopaedics. Developed countries like USA can handle this age group quite well, but developing countries which will handle most of the burden of aging population in the 21<sup>st</sup> century are ill equipped.

## MAGNITUDE OF PROBLEM

Geriatric fractures are an increasing medical problem all over the world. The lifetime risk of any osteoporotic fracture ranges between 40% and 50% in women and 13-22% in men<sup>5</sup>. A considerable rise in these fractures is estimated worldwide during the coming decades and the related costs for the society will be increasing as well. The high rate of fractures in the elderly result from high incidence of falls and the fragile nature of their bones due to osteoporosis.

## TYPES OF FRACTURES

### Hip Fractures

Hip fractures are one of the most common emergencies in Elderly population<sup>6</sup>. In the aged individuals these fractures may have devastating consequences. These fractures continue to be a leading cause of excessive morbidity and premature mortality among older individuals. The hip fracture will continue to be of substantial importance for the medical fraternity at large and to orthopaedic surgeon in particular. The risk of hip fractures increase exponentially with age and this trend is likely to continue in the near future as well. Worldwide, 1.6 million patients suffer a hip fracture each year and as the population continues to age, this figure will rise to 6.26 million by 2050<sup>7</sup>. Approximately 50% of patients will have permanent functional disability greater than that before fracture: up to 30% die within one year of surgery and a quarter of those living independently require long term nursing care<sup>8,9</sup>. For these fractures, conservative management is not an acceptable treatment alternative. Prolonged and painful immobilization results in specific complications such as pneumonia, urinary infection, decubitus, cachexia and mental deterioration.

Hip fractures occur in two anatomically distinct regions. Intertrochanteric and subtrochanteric fractures are more likely to occur in patients with a previously stiff Hip. The fracture is extracapsular and its blood supply is well preserved. These can be treated with cephalomedullary nails or sliding hip screw allowing the patient to be mobilized early.

Intracapsular fractures can be displaced or undisplaced. Displaced fractures have a high incidence of subsequent osteonecrosis<sup>10</sup>. The aim of treatment is to allow early mobilization of the elderly. Internal fixation with three cancellous cannulated screws is done in physiologically young individuals who have good bone density. Use of washers improve fixation in osteoporotic bone.

The ideal choice of operative treatment depends on the general physical condition and mental capacity of the patient. Hemiarthroplasty is recommended for older or medically comorbid patient with normal acetabulum. Total hip arthroplasty is the choice of treatment in active elderly patient in which both the femoral head and acetabulum is replaced. Total hip arthroplasty and hemiarthroplasty create an immediate weight bearing stability. Femoral neck screws, extramedullary and intramedullary hip screws create a controlled instability, which allows impaction of the fracture fragments<sup>11</sup>. Bhandari et al, conducted a meta-analysis of all randomized controlled trials comparing internal fixation and arthroplasty reported over a 33-year period. Cumulative data showed a decreased rate of revision surgery in the arthroplasty group and an increased risk of infection<sup>12</sup>. The relative risk of mortality in the arthroplasty group was higher during the first 4 months postoperatively but was no longer evident at 1-year follow-up. Reviewing the current literature, there is no consensus either supporting or rejecting the use of bipolar over unipolar hemiarthroplasty<sup>13,14</sup>.

Intertrochanteric fracture may be stable or unstable. Internal fixation of intertrochanteric fractures is the standard of care, irrespective of the age group. This allows early mobilization and avoids the complications which come with prolonged recumbency. Non operative management of such fracture is associated with high morbidity and mortality and complications such as deep venous thrombosis, pneumonia, decubitus ulcer etc. However one must weigh the risk of surgery and assess each patient individually. Stable fractures typically have 2 or 3 parts with intact medial and lateral buttresses and can be managed with sliding hip screw fixation. Unstable fractures are characterized by comminution, a reverse obliquity fracture line, or extension into the shaft of the femur. In these cases, the lateral buttress is not intact and will not provide an endpoint to sliding, so a sliding hip screw has a higher rate of failure in these fracture patterns. These fractures are best treated with an intramedullary nail. A fixed-angle device, such as an angled blade plate, may also be considered for these unstable fractures.

The British Geriatrics Society and British Orthopaedic Association has set out six standards for orthogeriatric care<sup>15</sup>:

- 1.) All patients with hip fracture should be admitted to an acute orthopaedic ward within 4 hour of presentation.
- 2.) All patients with hip fracture who are medically fit should have surgery within 48 hours of admission and during normal working hours.
- 3.) All patients with hip fracture should be assessed and cared for with a view to minimizing their risk of developing a pressure ulcer.
- 4.) All patients presenting with a fragility fracture should be managed on an orthopaedic ward with routine access to orthogeriatric medical support

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from the time of admission

- 5.) All patients presenting with fragility fracture should be assessed for antiresorptive therapy to prevent osteoporotic fractures.
- 6.) All patients with fragility fractures following a fall should be offered multidisciplinary assessment and intervention to prevent future falls.

Such a protocol needs to be developed for a developing country like India. This needs to be based on the problems and the needs which are specific to our country.

### **Spine injuries**

There is a relatively high prevalence of osteoporotic vertebral compression fractures (VCFs) in the elderly population. They usually incur the injury while performing normal daily activities, hence majority of them are stable. Medical treatment of these fractures includes bed rest, orthotics, analgesic medication and time. Percutaneous vertebroplasty (PVP) consists of percutaneous injection of biomaterial, such as methylmethacrylate, into the VCF to produce stability and pain relief. Kyphoplasty is a new technique, which introduces a balloon into the vertebral body transpedicularly to reduce the VCF while creating a cavity for the cement injection<sup>16</sup>. Many cervical spine injuries in older patients result from hyperextension of the neck as a result of fall or motor vehicle crash leading to central cord syndrome. The clinical outcomes are significantly worse in patients aged 70 years or older<sup>17</sup>.

### **Upper extremities**

Injuries to upper extremities typically pose a minimal risk of death, but loss of function of extremity can greatly reduce the older persons independence and will often lead to a permanent reduction in function, even after healing. Distal radius fractures are the most common upper extremity fracture in individuals aged 65 years and older with 15% of Caucasian women fracturing their distal radius after age 50<sup>18</sup>. Traditionally, these have been treated with closed reduction and cast immobilization<sup>19</sup>. However, depending upon the stability of fracture it may be fixed internally with K wires, or plates. Proximal humerus fractures are usually seen in elderly population. Their treatment must be individualized according to fracture pattern.

### **Pelvis and acetabulum**

Fracture of pelvis in older patient often occur as a result of a combination of decreased bone strength due to osteoporosis and a low energy mechanism of injury, such as fall from standing height. More serious high energy fractures can pose a significant threat to life. Older patients are less able than younger patients to tolerate the blood loss. Owing to the diminished strength of bone, older patients are at a higher risk for this type of injury from lower energy insults than would be required in younger patients. Most osteoporotic fractures are minimally displaced and do not require surgical therapy. However, in some patients, an insidious progress of bone damage leads to complex displacement and instability. Therefore, vertical sacral ala fractures, fracture dislocations of the sacroiliac joint, and spinopelvic dissociations are best treated with operative stabilization. Angular stable bridge plating, the insertion of a transsacral positioning bar, and ilio-lumbar fixation are operative techniques that have been adapted to the low bone mineral density of the pelvic ring and the high forces acting on it<sup>20</sup>.

Acetabular fractures in the elderly individuals are increasing in prevalence. There is enough evidence in the literature that acetabular fractures in elderly patients sustained as a result of low-energy mechanisms can be well treated by nonoperative management<sup>21</sup>.

### **Lower extremity**

Distal femoral fractures are more common in older patients whereas femoral shaft fractures typically occur in younger patients. Knee joint arthritis with associated stiffness may predispose the older patients to fractures in the distal femur near the knee, while increased mobility in younger patients may result in stress being concentrated farther up the

shaft of the femur. Proximal fractures of tibia may occur from a direct impact to the bone or by a medial or lateral rocking motion.

## **ROLE OF OSTEOPOROSIS**

Primary osteoporosis is an age related disease characterized by normal bone composition with a decrease in the quantity of osseous tissue per unit volume. Osteoporosis occurs with aging as the creation of new bone fails to keep up with the absorption of old bone. This bone loss continues equally in men and women at a rate of 0.3% to 0.5% per year. An accelerated phase of bone loss, which occurs at the rate of 2% to 3% per year begins after menopause and is related to decreased estrogen levels. Other factors responsible are poor diet, lack of exercise and medications.

In patients with osteoporosis, this trabecular lattice is thin and the medullary canal is wide. This occurs in osteoporosis by the process of endosteal bone erosion coupled with periosteal bone deposition. The diaphysis compensates for loss of bone by expanding the remaining osseous material. Progressive enlargement of diaphyseal bone dimensions decrease bending stresses, leads to greater moments of inertia, and helps to mitigate worsening fracture risks. Trabecular bone has no such mechanism to compensate for mineral loss. Bone that are primarily trabecular include vertebral bodies, proximal humerus and distal radius. This is consistent with the observation that vertebral compression fractures are the most common followed by hip fractures and fractures of the wrist<sup>22</sup>. Severe osteoporosis with thinner cortical bone of the femoral diaphysis is seen more often in patients with trochanteric fracture than in patients with femoral neck fracture<sup>23</sup>. A reduction in bone mass may result in fracture after being subjected to lower stresses than those required to fracture normal bone. Such fractures are termed fracture of insufficiency. Similarly, the relative hip fracture risk and the risk of other osteoporotic fractures are increased in patients who have reduced bone density. Although osteoporosis is the single most important factor, the physician who encounters these patients should be familiar with other important causes of hip fractures in elderly.

Treatment with 1200 to 1500mg of calcium along with 800IU daily of Vitamin D is recommended. In elderly women, the administration of both calcium and vitamin D has been shown to prevent hip and other non-vertebral fractures. Bisphosphonates are now increasingly being used in the treatment of osteoporosis. It binds to the hydroxyapatite of bone and inhibits osteoclast activity. These agents have been shown to increase bone mineral density, and the relative reduction in risk for fracture with each treatment is about 40 to 60%<sup>24</sup>. Alendronate and risodronate are the most widely used bisphosphonate. Zoledronic acid, a bisphosphonate given by once-yearly intravenous infusion, has been shown to decrease bone loss and mortality after hip fractures.

## **ROLE OF PHYSICIAN IN CARE OF GERIATRIC PATIENTS**

### **General practitioner (GP)**

GPs are the first person to come in contact with patient. They usually are trusted in their locality. Their role is critical in primary and secondary prevention. They also provide most post fracture care in subacute rehabilitation facilities. They are in the best position to provide osteoporosis management, monitor treatment and compliance and assess for any complication or need for further intervention. They should coordinate with orthopaedic surgeon or orthogeriatrician.

### **Hospital physicians**

They take care of the patient whenever he arrives in the hospital in acute setting. They communicate with patient and their attendants in the emergency department. Since they are based in the hospital in which the final treatment has to be provided, they are familiar with acute care policies, procedures, techniques, routines and are often able to coordinate and manage hospital care better than primary care providers.

### **Internal medicine specialists**

They are consulted according to the presence of co-morbid medical conditions. They facilitate to hasten the surgery. The physician should not ask for unnecessary investigation, which can delay the definitive care of the patient.

### **Medical Evaluation**

Early surgical fixation improves results by decreasing length of stay and complications. The elderly patients have multiple co-existing medical conditions which increase the risk of surgery and anaesthesia. Coronary heart disease, pulmonary disease, diabetes, hypertension neurological conditions, GIT conditions all must be evaluated. The pre-operative medical evaluation aims to identify the risk and optimize them before surgery. This definitely increases the role of anaesthetist in the preoperative evaluation and management of such conditions. Unnecessary preoperative test should be avoided to avoid potential delay in surgery. Psychiatric disorders occur in about 20% of patients, and should be evaluated but these are not necessarily severe and are often sporadic, associated with the sudden admission to hospital with all its fears and strangeness. Some conditions, such as vertebra-basilar insufficiency may cause the patient to topple backward when walking, and this tendency may be exacerbated by a walking frame, whereas a frame with wheels eliminates the repeated neck flexion and extension which occurs each time the ordinary walking frame is lifted forward.

Blood transfusion should be considered if the preoperative hematocrit level is less than 30%. The prothrombin time/INR should be checked because the patient may be on chronic anticoagulant therapy or may be a chronic alcoholic. If the INR is less than 1.5, surgical intervention may proceed. Markedly elevated INR can be lowered with options ranging from watchful waiting to the use of oral vitamin K or fresh-frozen plasma<sup>26</sup>. As early surgery has been shown to improve outcomes, therefore, waiting for 4 or 5 days for the INR to gently drift down is not optimal in this group of population<sup>27</sup>. The use of oral vitamin K may expedite this process.

### **ANAESTHESIA**

The choice of anaesthesia typically depends on the preference of the patient and anaesthesiologist and on the patients co-morbid conditions. Meta-analysis suggest that as compared with general anaesthesia, regional anaesthesia is associated with decreased mortality, decreased incidence of thromboembolism, myocardial infarction, bleeding complications, pneumonia, respiratory failure, and renal failure<sup>28</sup>. Compared with General anaesthesia (GA), regional anaesthesia is associated with reduced incidence of deep vein thrombosis and decreases early mortality, but longer operative times<sup>29</sup>. There is no difference between GA and regional anaesthesia in terms of postoperative delirium in elective surgery<sup>30,31</sup>. However with hip fracture surgery, regional anaesthesia has two fold reduced risk of delirium compared to GA. Yocum et al showed a relationship between intraoperative hypotension and postoperative cognitive decline in patients with preoperative hypertension<sup>32</sup>. Intraoperative hypotension may also predispose patients to cardiac and renal ischemia.

### **TREATMENT**

The aim of all the surgical procedures in this group is to make the patient ambulatory as early as possible. For these reasons, the best surgical procedure on an old patient is one so designed that walking can start at once. The treatment doesn't end with the surgical procedure and should be considered an incident in the general rehabilitation of the patient.

### **POSTOPERATIVE CARE**

The postoperative care should be carried by a multidisciplinary team and an institutional protocol should be established. The protocol must address pain control, DVT prophylaxis, fluid management, blood

transfusion, delirium identification and rehabilitation. Whenever possible they should be mobilized as early as possible. Unnecessary immobilization should be avoided because of the risk of accelerated bone loss and decubitus related complications. A close working relationship must exist between orthopaedic surgeons and the geriatric department. Frequently a dedicated rehabilitation unit may be the best way to achieve this. Apart from the experienced nursing staff, it is necessary to make specific provision for physiotherapy and occupational therapy for optimal post-operative care of such patients.

### **ROLE OF ORTHOGERIATRICS**

Due to the ever increasing share of geriatric patients in an orthopaedic ward, many have turned to the idea of setting up of a joint geriatric orthopaedic (orthogeriatric) wards as the possible solution to the problem. The primary business of an orthogeriatrician is to take care of hip fractures in this population. The most important aim in geriatric orthopaedics should be to make the patient walk as soon as possible. The next most important is to see that the patient can undertake the ordinary activities of daily living. This is achieved by optimizing medical management so that complications are prevented, early appropriate treatments provided, functional outcomes are improved, discharge is facilitated and mortality and morbidity are reduced.

### **MODELS OF ORTHOGERIATRIC CARE**

There are various models of care in practice and it is this diversity that makes it difficult to evaluate the usefulness of orthogeriatrics. Large meta analysis have failed to demonstrate much improvement in outcomes such as length of stay, mortality and return to functional independence. However there are multiple case studies that would suggest otherwise<sup>25</sup>.

### **TRADITIONAL ORTHOPAEDIC CARE**

Patients are admitted and cared by orthopaedic surgeons in their routine ward. Patients requiring medical services are referred to physician. This is not a model of care and is only used in settings with lack of resources.

### **GERIATRIC ORTHOPAEDIC REHABILITATION UNIT (GORU)**

In this model, perioperative care is under the orthopaedic surgeon and the patient is transferred early postoperatively to a geriatric rehabilitation unit. Selection of patients for transfer may be by the orthopaedic team, specialist liaison nurse or geriatrician. The extent of orthopaedic input after transfer is variable but should be at least weekly. There is some evidence that this model increases length of stay and may not be cost effective. These units are located separately from acute orthopaedic wards. Geriatric inputs are provided on a timetabled basis, in the form of ward round. An additional benefit is the opportunity to provide support and education to the orthopaedic junior staff.

### **COMBINED ORTHOGERIATRIC CARE**

Patients are admitted under the joint care of orthopaedic surgeon and geriatrics. There is preoperative assessment by the geriatricians and this regular review continues throughout the patient stay. Rehabilitation may occur in the same or a different unit.

### **EARLY SUPPORTED DISCHARGE SCHEMES**

Community rehabilitation schemes are being introduced in many branches of medicine and orthogeriatrics is no exception. These can be new services or may make use of existing schemes. This allows patients to be discharged earlier from the acute setting either for ongoing rehabilitation in their own homes or in a dedicated facility in the community.

**Orthogeriatric liaison nurse/ hip fracture nurse:** This is usually a senior nurse who takes responsibility for the patient throughout the course of their clinical care, coordinating initial assessment, facilitating preoperative work up, supervising postoperative care, rehabilitation,

discharge planning, secondary prevention and follow up.

The benefits of such an orthogeriatric liaison service include<sup>25</sup>:

- Improved medical care in the pre and perioperative period
- Optimizing patient care preoperatively thus reducing delays to surgery
- Earlier recognition and intervention when complications occur reducing morbidity and mortality
- Better communication with patients, relatives and care givers
- Improved communication and working of the multidisciplinary team
- Reduction in adverse events
- Earlier and more appropriate rehabilitation
- Assessment and secondary prevention of falls and fractures
- Improved discharge planning and use of discharge resources
- Reduced length of stay
- Education and training of surgical, medical and professions allied to medicine teams
- Audit

## PREVENTION OF GERIATRIC FRACTURE

Since 90-95% of hip fractures are caused by fall, so prevention should aim to decrease the risk of fall and to identify individuals with low bone mass and individuals with risk factor for osteoporotic fractures. Devices such as hip protector and pharmacological interventions like calcium, vitamin-D, Hormone replacement therapy and bisphosphonates are included in the preventive aspect. Various kind of exercise such as load bearing exercises increase bone mineral density and may indirectly improve mobility, muscle strength and balance, thereby reducing the risk of falls. Other risk factor predisposing to falls such as diminished visual acuity, neurological impairment balance problems, inadequate footwear etc should be looked into. Multifactorial risk assessment by geriatricians followed by interventions targeting the identified risk factor may be successful in preventing falls. Environmental risk factors like lack of stair railing; insufficient lightening should also be assessed and corrected.

## SUMMARY

Geriatric fractures are multifactorial and increasing public health problem worldwide. Prevention strategies should be employed to decrease their incidence. This may decrease the health care cost significantly. Developing countries need to establish models of orthogeriatrics for care of these patients. Recognition of co-morbid medical condition and early surgery may help in ensuring good outcome. The orthopaedic surgeon should coordinate closely with other medical specialist for optimum care of the patient.

## REFERENCES

1. Mann NC, Cahn RN, Mullins RJ, Brand DM, Jurkovich GJ. Survival among injured geriatric patients

- during construction of a statewide trauma system. *J Trauma*.2001; 50:1111-1116.
2. DeMaria EJ, Kenney PR, Merriam MA, et al. Survival after trauma in geriatric patients. *Ann Surg*.1987; 206:738-743.
3. Pellicane JV, Byrne K, DeMaria EJ. Preventable complications and death from multiple organ failure among geriatric trauma victims. *J Trauma*.1992; 33:440-444.
4. Perdue PW, Watts DD, Kaufmann CR, et al. Differences in mortality between elderly and younger adult trauma patients: geriatric status increases risk of delayed death. *J Trauma*.1998;45:805-810
5. Johnell O, Kanis J. Epidemiology of osteoporotic fractures. *Osteoporos Int* 2005; 16(Suppl.2):3-7.
6. Dhanwal DK, Dennison EM,Harvey NC, Cooper C Epidemiology of hip fracture: worldwide geographic variation *Indian J Orthop*. 2011 Jan-Mar; 45(1): 15-22.
7. Cooper C, Campion G, Melton LJ., 3rd Hip fractures in the elderly: A world-wide projection. *Osteoporos Int*. 1992;2:285-9.
8. Keene GS,Parker MJ, Pryer GA. Mortality and morbidity after hip fracture. *BMJ*1993; 307:1248-50.
9. Marottoli RA, Berkman LF, Cooney LM. Decline in physical function following hip fracture. *J Am Geriatr Soc*1992; 40:861-6.
10. Thuan V Ly, Marc F Swiontkowski Management of femoral neck fractures in young adults *Indian J Orthop*. 2008 Jan-Mar; 42(1): 3-12
11. Anapur P, Mahomed N,Gandhi R .Fractures in elderly : when is hip replacement necessary *Clin Interv Aging*. 2011; 6: 1-7Fractures in the elderly: when is hip replacement a necessity?
12. Bhandari M, Devereaux PJ, Swiontkowski MF. Internal fixation compared with arthroplasty for displaced fractures of the femoral neck: A meta-analysis. *J Bone Joint Surg Am*. 2003;85:1673-1681.
13. Parker MJ, Guruswamy K. Arthroplasties (with and without bone cement) for proximal femoral fractures in adults. *Cochrane Database Syst Rev*. 2004;2:CD0001706.
14. Raia FJ, Chapman CB, Herrera MF, Schweppe MW, Michelsen CB, Rosenwasser MP. Unipolar or bipolar hemiarthroplasty of femoral neck fractures in the elderly? *Clin Orthop Relat Res*.2003;414:259-265
15. British orthopaedic association. The care of patients with fragility fractures (the blue book). London: British Orthopaedic Association; 2007. [www.fractures.com/pdf/BOA-BGS-Blue-book.pdf](http://www.fractures.com/pdf/BOA-BGS-Blue-book.pdf)
16. A. Mehbod, S. Aunoble, J. C. Le Huec Vertebralplasty for osteoporotic spine fracture: prevention and treatment. *Eur Spine J*. 2003 October; 12(Suppl 2): S155-S162
17. Lenehan B, Street J,O'Toole P, Siddiqui A, Poynton A Central cord syndrome in Ireland: the effect of age on clinical outcome. *Eur Spine J*. 2009 October; 18(10): 1458-1463.
18. Cummings SR, Black DM, Rubin SM. Lifetime risks of hip, Colles', or vertebral fracture and coronary heart disease among white postmenopausal women. *Arch Intern Med*.1989;149:2445-2448.
19. Chung KC, Shauer MJ, Birkmeyer JD. Trends in the United States in the treatment of distal radial fractures in the elderly. *J Bone Joint Surg Am*. 2009;91(8):1868-1873.
20. P. M. Rommens, D. Wagner, A. Hofmann Surgical management of osteoporotic pelvic fractures: a new challenge. *Eur J Trauma Emerg Surg*. 2012 October; 38(5): 499-509
21. Brian W. Hill, Julie A. Switzer, Peter A. Cole Management of High-Energy Acetabular Fractures in the Elderly Individuals: A Current Review *Geriatr Orthop Surg Rehabil*. 2012 September; 3(3): 95-106.
22. Alexandru D,So W. Evaluation and Management of Vertebral Compression Fractures. *Perm J*. 2012 Fall; 16(4): 46-51
23. Maeda Y, Sugano N, Saito M, Yonenobu K. Comparison of Femoral Morphology and Bone Mineral Density between Femoral Neck Fractures and Trochanteric Fractures. *Clin Orthop Relat Res*. 2011 March; 469(3): 884-889.
24. Davidson CW, Merrilees MJ, Wilkinson TJ, McKie JS, Gilchrist NL Hip fracture mortality and morbidity—can we do better. *N Z Med J*. 2001 Jul 27; 114(1136):329-32.
25. Brucewell C, Gray R ,Rai GS. Orthogeriatrics in Essential facts in geriatric medicine second edition -Abingdon, UK.217-219.
26. Marsland D, Mears SC, Kates SL. Venous thromboembolic prophylaxis for hip fractures. *Osteoporos Int*. 2010;21(suppl 4):S593-S604.
27. Simunovic N, Devereaux PJ, Sprague S, et al. Effect of early surgery after hip fracture on mortality and complications: systematic review and meta-analysis. *CMAJ*. 2010;182(15):1609-1616.
28. Rodgers A, Walker N, Schug S, McKee A, Kehlet H, van Zundert A, Sage D, Futter M, Saville G, Clark T, MacMahon S. Review Reduction of postoperative mortality and morbidity with epidural or spinal anaesthesia: results from overview of randomised trials. *BMJ*. 2000 Dec 16; 321(7275):1493
29. Urwin SC, Parker MJ, Griffiths R General versus regional anaesthesia for hip fracture surgery: a meta-analysis of randomized trials. *Br J Anaesth*. 2000 Apr; 84(4):450-5.
30. Bryson GL, Wyand A. Evidence-based clinical update: general anaesthesia and the risk of delirium and postoperative cognitive dysfunction. *Can J Anaesth*. 2006;53(7):669-677.
31. Sieber FE, Zakriya KJ, Gottschalk A, et al. Sedation depth during spinal anaesthesia and the development of postoperative delirium in elderly patients undergoing hip fracture repair [erratum in *Mayo Clin Proc*. 2010;85(4):400]. *Mayo Clin Proc*. 2010;85(1):18-26.
32. Yocum GT, Gaudet JG, Teverbaugh LA, et al. Neurocognitive performance in hypertensive patients after spine surgery. *Anesthesiology*. 2009;110(2):254-261

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