The pandemic of geriatric hip fractures, where India stands.

Unmesh Chakraverty¹

Introduction
134 million Indians are aged more than 60. By 2020 this number would be 315 million (20% of the population) a growth of 354% [1,2]. Worldwide the demographic transition (shift from high mortality/high fertility to a low mortality/low fertility), fast eroding traditional family system with rapid modernisation and urbanisation is a colossal problem which can only be tackled only by a better understanding and adequate preparedness.

Locomotor problems in India ranges between 33-40% of all morbidities in the elderly second only to vision problems [2]. Data from Indians in Singapore show a female predominance of 3:1, when extrapolated the numbers of hip fractures (validated by I.C.M.R.) show a worrying trend. Worldwide 1.6 million hip fractures occur annually. By 2050 this number would be between 4.5 to 6.3 million [3,4]. To meet this challenge let’s review recommendations, understand the role of teamwork and the responsibilities of our society.

Comorbidities
92% of these patients have at least one comorbidity. Higher readmission rate is seen with alcoholism, parkinsonism, rheumatoid and osteoarthritis. Interestingly diabetes is not associated with higher readmission. Delirium is a frequent, non quantifiable yet distressing comorbidity. Risk includes age > 65, dementia, hip fracture or severe illness. A room with a window, a clock and newspaper is an effective tool.

Decision making
68.4% surgeries are done by moderate volume surgeons doing 10-29 surgeries per year [6]. The Finnish hip database of 68000 fractures show complication rates of 5.4% in neck of femur, 4.9% in sub trochanteric and 1.4% in inter trochanteric fractures [6]. Linn’s [7] paper in 11184 nonagenarians followed up to death showed.

They concluded that risk factors for death were higher age, male sex, inter trochanteric fractures and high Charlson comorbidity index. Risk factors for reoperation were higher age, fracture neck of femur and higher Charlson comorbidity index.

Inacio et al [8] from the American hip registry of patients more than 65 years of age showed. Another challenge in decision making is the family apprehension. Updating ourselves helps us in educating and engaging the family in informed decision making during the treatment as well as better home care and social awareness of the disease.

Timing and teamwork
Nature [11] in 2018 published its scientific reports based on 31242 patients aged 60 years and above with acute hip fractures. They compared mortality, peri operative complications, functional capacity and quality of life among patients operated within 48 hours and after 48 hours. It was concluded that

- patients operated within 48 hours of trauma had a 20% reduced risk of 1 year mortality.
- 1 year mortality increased by 14-21% for per day delay in surgery among people with dependancy for activities of daily living.
- No study showed survival benefit of delayed surgery.

It has been emphasised in various guidelines (AAOS, NICE) that a dedicated orthogeriatric team which can rapidly correct comorbidities like anemia, hypovolemia, electrolyte imbalance, correctable arrhythmia, diabetes, hypertension etc is a necessity. A hospital policy prioritising such fractures by providing theatres, senior surgeons, experienced staff irrespective of holidays has been shown statistically to improve outcomes. The orthopaedic surgeon has to be the captain of this orthogeriatric team and has to prioritise an early return of the elderly to painless full weight bearing.

The Australian registry shows overall 52% use of hemicrthroplasty, 32% fixation, 15% use of THR for geriatric hip fractures [9]. THR had the highest complication rate. Centres performing more than 200 THR per year had better outcomes. The American registry [8] shows 93% use of hemi arthroplasty for neck of femur and 96% use of fixation for IT fractures. Reoperation rates have been 2.2 % implant change and 18% overall.

¹Consultant Orthopaedic Surgeon and Director, Oriana Hospital and Chakravert Clinic, Varanasi, Uttar Pradesh, India.

Address of Correspondence:
Dr. Unmesh Chakraverty,
Oriana Hospital and Chakravert Clinic, Varanasi, Uttar Pradesh, India.
E-mail: unmeshchak@indiatimes.com

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Figure 1: Estimated hip fractures in India

Figure 2: T-score of urban Indian population across decades [5]

Figure 4: Change in lumbar spine and hip BMD in women. [10]

Table 1. American Society of Anesthesiologist grading (A.S.A.), American hip registry [8]

<table>
<thead>
<tr>
<th>A.S.A. G 1,2</th>
<th>n=12562</th>
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<tbody>
<tr>
<td>25%</td>
<td></td>
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<tr>
<td>A.S.A. G3 and above</td>
<td>65.90%</td>
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Table 2. Co morbidities, Australian hip registry [9]

<table>
<thead>
<tr>
<th>Endocrine (DM, dehydration)</th>
<th>51%</th>
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<tr>
<td>Circulatory (hypo, hypertension, AF)</td>
<td>43%</td>
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<tr>
<td>Delirium</td>
<td>20%</td>
</tr>
<tr>
<td>Respiratory</td>
<td>18%</td>
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<tr>
<td>Type 2 DM</td>
<td>19%</td>
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<td>Anemia</td>
<td>20%</td>
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Table 3:

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<th>Mortality rate</th>
<th>1 year</th>
<th>2 year</th>
<th>5 year</th>
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<tr>
<td>29.50%</td>
<td>45%</td>
<td>78.10%</td>
<td></td>
</tr>
<tr>
<td>Re operation rate</td>
<td>7.30%</td>
<td>9.20%</td>
<td>11.60%</td>
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Table 4. Complications

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<thead>
<tr>
<th>n=12562</th>
<th>(65y-74y- 15.3%, 75y-84y- 34.7% &amp; &gt;85y 36.9%)</th>
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<tbody>
<tr>
<td>30 day death</td>
<td>6.20%</td>
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<tr>
<td>90 day readmission</td>
<td>22.10%</td>
</tr>
<tr>
<td>Pneumonia (commonest)</td>
<td>11.40%</td>
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Osteoporosis
The allied study by West Virginia University and Bengaluru medical college [5] shows the changes in bone density across the decades among Indians.

The management moves not only around drugs but also public awareness about nutrition, exercises and fall prevention. 93% of geriatric hip fractures are due to falls, 35% were due to slip or trip, 48% were at home and 27% at care homes [9]. Prioritising fall prevention by using grab bars, avoiding small rugs, dry floors, walking aids and coordination exercises can help.

The last few years have seen an increase in the easy availability of various newer drugs as well as reduction in the cost of therapy. Consensus is lacking regarding drug of choice, duration of therapy, plateau effect, improvement in hip bone density, actually reduction in fracture incidence, efficacy of combinations, washout periods etc. The review article by Benjamin Z Leder, JBMR, 2018 [8] gives a broad overview of the above questions.

TPTD->DMAB 2 years Teriparatide followed by 2 years Denusumab,
DMAB->TPTD 2 years Denusumab followed by 2 years Teriparatide,
COMBO->DMAB 2 years combined Teriparatide, Denosumab followed by 2 years Denosumab.

Newer studies have reiterated that bisphosphonates get embedded in bone and have a residual effect for many years. Thus they are the preferred drugs for early osteoporosis, need a wash out phase, they can be used after anabolic (TPTD) and monoclonal antibodies (DMAB) to maintain bone density.

Awareness and challenges
The complexities of our country with an inhomogeneous health penetration are immense. Scientific research is ever growing, promising better surgical outcomes, better medicines for osteoporosis and newer technology for unmet gaps in the picture. Still the question remains, are they superior to the existing modalities? Only database created by linking personal data at district, state, national level, hospital records, surgical registries, benefit schemes, death register etc. when amalgamated can validate the findings. Sadly the Indian government does not recognise Osteoporosis as a major health problem so neither a database nor guidelines exist.

The social understanding of ageing is equally important. Engaging them actively in different areas of life including role playing, role performance and economic self sufficiency is paramount. The family must focus on emotional support while the society, public policy must develop self sustained, elderly friendly material and financial support system.

Conclusion
Science alone cannot solve this problem. Despite all the evidence, expertise and infrastructure complications can sometimes derail our faith in recommendations. To tackle this problem we must constantly develop our knowledge though evidence based guidelines, upgrade our skills through teamwork and improve our team and society’s attitude to the disease.
References


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10. Benjamin Z Leder, Optimizing Sequential and Combined Anabolic and Antiresorptive Osteoporosis Therapy, JBMR Plus / Volume 2, Issue 2, 08 February 2018,


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