The Societal Burden of Poor Persistence to Treatment of Osteoporosis in Sweden

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Introduction

• Osteoporosis is a skeletal disease characterized by low bone density and bone structure deterioration

• The main clinical complication of osteoporosis is bone fractures

• At ISPOR Paris 2009 we reported that persistence to treatment of osteoporosis in Sweden is poor\(^1\)
  - \(\sim\)25% of all patients discontinue treatment immediately after the first prescription
  - \(<50\%\) of patients take their osteoporosis medication for \(>1\) year

• The objective of this study was to estimate the annual societal burden of poor persistence to treatment of osteoporosis in Sweden
  - A second aim was to estimate the monetary net benefit of improved persistence

Methods – Target Population

- Prevalence-based burden evaluation based on an annual cohort of treatment-naïve* patients
- Target population extracted from the Swedish Prescribed Drug Register:
  - All treatment-naïve women and men who started treatment during 2009 with either alendronate, risedronate, strontium ranelate, or raloxifene
  - ≥50 years of age
  - Patients with secondary osteoporosis (e.g. Paget's Disease) and/or neoplasms were excluded

*Not received treatment during the last three years
Methods – Model

• The annual burden was estimated using a published Markov model\(^1\)
  - Standard model of osteoporosis
  - Four fracture states (clinical vertebral, hip, wrist, other osteoporotic)
  - Populated with the latest Swedish cost, utility and epidemiological data

• Patients were stratified into groups according to:
  - Sex (female/male)
  - Age (50-59 years, 60-69 years, 70-79 years, and 80+ years)
  - Initial treatment type (alendronate, risedronate, strontium ranelate, and raloxifene)

• The burden was estimated in terms of undiscounted lifetime costs and quality-adjusted life-years (QALYs)
  - Costs included from a societal perspective

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\(^1\) Ström, O., et al., Cost-Effectiveness Model for Denosumab Incorporating FRAX\(^\circledR\) and Adherence in a UK Setting. Osteoporos Int, 2009. 20 Suppl 1: p. S1-190
Methods – Assumptions/Data 1(2)

- Treatment offset (residual effect) was assumed to be equal to time on treatment
- Persistence estimates taken from the Swedish Adherence Register Analysis (SARA)
  - Persistence estimates available for women and men Year 1 to 4
  - Conservatively assumed that no patient discontinued during Year 5
- We also estimated the net benefit (NB) of improved persistence:
  - Five hypothetical interventions were investigated, with improvements in the persistent proportion of 10%, 20%, 30%, 40%, and 50%, respectively
  - Estimated as improved vs. real-world persistence
Methods – Assumptions/Data 2(2)

• The burden was measured in relation to perfect persistence to a 5-year treatment duration (perfect vs. real-world)
Results 1(3)

- Annually, a total of 1,018 fractures were estimated to be caused by non-persistence to treatment of osteoporosis in Sweden.
- These fractures resulted in a substantial use of health care resources related to morbidity:
  - €8.6 m, €1.1 m, and €16.3 m were lost annually due to extra resource utilization within inpatient, outpatient, and nursing home care, respectively (€26 m in total).
Results 2(3)

- However, achieving perfect persistence also means that more drugs will be used by the patients
  - Therefore, drug and treatment management cost increased by €9.5 m per year
- In addition to the cost, 771 QALYs were estimated to be lost annually
  - Reduced quality-of-life and increased mortality from the additional fractures
- Using a societal willingness-to-pay (WTP) for a QALY of €60,000, the total annual burden was estimated at €63 m
- Including cost in added life-years, the burden was estimated at €54 m
Results 3(3)

- Improving persistence with 10%-50% would lead to a total NB at between €2.9 m and €14.7 m (WTP for a QALY: €60,000)
  - Indicates how much resources that could be spent to achieve an increase in persistence in a cost-effective manner
- Per started 5-year treatment, it would be cost-effective to allocate between €225 and €1,130 to increase persistence with 10%-50%
  - The NB of improving persistence varied with age and gender
  - For women, it would be cost-effective to spend between €103 and €1,558, depending on age at treatment initiation and level of persistence improvement
  - The corresponding estimates for men were €101 and €760
Limitations

- Persistence estimates only available Year 1 to 4
  - Assumption of perfect persistence during Year 5 resulted in an underestimation of the burden
- Five-year treatment duration
  - Recommended length of osteoporosis treatments in Sweden
  - Still, other durations would have generated different burden assessments
- Assumptions regarding residual effect
  - Inconclusive evidence for actual drug-specific residual effects
  - Estimates with fixed offset times included in final publication
- Medication compliance not included at all
  - Including compliance would undoubtedly have added to the burden
Conclusion

• The estimated annual net use of health care resources (€16.5 m) caused by suboptimal persistence was larger than the total spending on osteoporosis medications in Sweden during 2009\(^1\)
• Suboptimal real-world persistence was associated with decreased quality and quantity of life (771 QALYs annually)
• The total annual societal burden of real-world persistence to treatment of osteoporosis in Sweden is substantial (€63 m)
• Improving persistence can be cost-effective
• Poor persistence to treatment of osteoporosis is an important and costly health problem for both the patient and society

\(^1\) IMS Health Sales Statistics
Thank you!