

# Suboptimal Osteoporosis Management: Moving Beyond Detection



Ample evidence confirms that patients taking glucocorticoids are at high risk of osteoporosis-related fractures<sup>1-5</sup>. Despite the proven effectiveness of osteoporosis-related fracture prophylaxis and despite the existence of guidelines recommending such prophylaxis, prevention and treatment of glucocorticoid-induced osteoporosis (GIOP) remains suboptimal. Numerous international studies have demonstrated important variation in preventive GIOP management, with treatment rates ranging from about 6% to 60%<sup>6-13</sup>. However, there has been little published to date on methods to improve the rate of GIOP prophylaxis.

In this issue of *The Journal*, Naunton, *et al* present findings from a controlled intervention study of a regional, multifaceted program designed to increase preventive pharmacologic therapy for GIOP among general practitioners (GP) and pharmacists in Tasmania<sup>14</sup>. The strategies used by the authors were multifaceted and interactive: printed educational material, guidelines adapted by local opinion leaders, feedback from a local audit of preventive osteoporosis management, and an outreach visit. In addition, the pharmacists received dispensing reminders and refrigerator magnets for patients. The outreach visit, also known as academic detailing, involved a resource-intensive one-on-one visit with the GP or pharmacist by a research pharmacist. Southern Tasmania received the intervention, while the control region was Northern Tasmania.

Analyses presented by the authors suggest an overall positive and significant intervention effect. The first analysis compared hospitalized patients in the post-intervention period to the pre-intervention period using hospital admission and discharge medication data. The authors observed an increase in preventive GIOP treatment, including an increase in the prescribing of bisphosphonates. The baseline frequency of calcium and vitamin D use was low and increased only slightly, despite the guidelines recommending these measures for all patients receiving glucocorticoids. Interestingly, based on their Table 2, hospitalization itself appears to be associated

with an increase in osteoporosis preventive therapy. The second analysis, which was based upon outpatient prescription data, demonstrated that GIOP treatment increased in both the intervention and control regions; however, improvement was greatest in the intervention region. The authors ascribe the increase in the control region to heightened awareness and pharmaceutical industry promotion of bisphosphonates to physicians, which occurred in both regions, and to possible contamination.

Understanding the results presented by the authors requires consideration of several methodological details. First, lack of randomization raises concerns about potential residual confounding, and this may have influenced the strong temporal trends observed in this study. Further, hospitalized patients, who tend to be older and have more comorbidities, represent a selected population that may be dissimilar from the general community-dwelling population, although the authors were likely aiming to study the highest risk patients. Second, the analysis occurred at the patient level, while the intervention was applied to GPs and pharmacists. Thus, the analysis did not account for the nesting of patients within physicians, which may lead to artificial inflation of statistical significance. Finally, one of the major study outcomes, defined daily dose determined from prescription data, is ambiguous and difficult to interpret. The defined daily dose represents the unit quantities of a drug dispensed at a population level. In this study, the ratios of the defined daily dose of osteoporosis preventive agents relative to the defined daily dose of glucocorticoids were compared between the 2 regions pre- and post-intervention. This ratio may be increased by prescribing higher preventive therapy doses to the same patients, by prescribing lower glucocorticoid doses to the same patients, by prescribing preventive therapy to more patients, or by prescribing glucocorticoids to fewer patients. Thus, one cannot know which combination of these factors has led to the change in the defined daily doses measurement observed.

Despite the encouraging findings of this study, with the

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relatively brief period of time between the intervention and the outcomes assessment, it is difficult to determine how the various aspects of the multifaceted approach would have sufficient time for a “trickle-up effect.” Patients would need to present to the pharmacist with a prescription for glucocorticoids, receive counseling by the pharmacist, and then return to the GP for a preventive GIOP therapy prescription. The authors acknowledge that the study was not designed to determine which particular aspects of these interventions contributed to the improved management of GIOP prevention. They also note that the longterm effects of the intervention on practice patterns, which are known to change over time, cannot be determined from this study.

The decision to include only GPs in the study was justified by the authors, who note that (1) the majority of glucocorticoid therapy prescribing would be done by GPs on a continuing basis, (2) patients see their GPs more frequently than specialists, and (3) there is an increased opportunity for preventive therapy implementation by GPs. Although some US studies have concurred with this finding<sup>9</sup>, in one patient survey the majority of patients received their glucocorticoid prescriptions from a specialist<sup>7</sup>. As well, GPs tend to be influenced by what hospital consultants are prescribing<sup>15</sup>. Differences in health care systems across continents highlight the difficulties with generalizing these types of interventions to other systems.

A large body of literature documents variable success of approaches similar to those taken by Naunton, *et al* to improve health care quality. Methods include the use of educational materials, educational outreach visits or academic detailing, use of opinion leaders, audit and feedback, reminder systems, economic incentives, public reporting, and patient-oriented interventions. Effective strategies are generally, like Naunton's, interactive, multifaceted approaches, but the effect sizes tend to be small<sup>16,17</sup>. The significant effect size documented in the current study are consistent with previous Cochrane reviews<sup>16</sup>. Further improvement in the effectiveness of quality improvement strategies may be achieved through incorporation of needs assessments prior to planning and instituting such interventions<sup>18,19</sup>. Patient empowerment or activation is another factor that may result in improved adherence and satisfaction<sup>17</sup>. For example, bone mineral density (BMD) assessments followed immediately by osteoporosis education motivated 90% of women to favorably alter their lifestyle to reduce their risk of osteoporosis-related fractures, although the response rate for the survey was only 25% of those who received the intervention<sup>20</sup>. In another study, patients' understanding of their BMD results was identified as a factor associated with appropriate osteoporosis treatment<sup>21</sup>.

Multifaceted, interactive approaches to change behavior are likely associated with significant costs, particularly if they need to be repeated or sustained over time. These costs must be compared to potential cost savings that may be appreciated through reduction in adverse outcomes as a result of such

programs, such as fractures in the case of GIOP. The lack of cost effectiveness analyses and assessment of the impact on clinically meaningful patient outcomes are significant limitations in most quality improvement studies<sup>16</sup>.

The study by Naunton, *et al* is an excellent first step beyond identification of suboptimal GIOP preventive therapy, and proposes a potential approach to improving the management of this significant health problem. The results of this study are important, especially in comparison to small effect sizes and variable success of other similar interventions, and highlight the need for further studies in improving quality of preventive GIOP care. Before these findings can be applied to other settings, questions about sustainability, generalizability to other health care systems, cost effectiveness, and effect on clinically meaningful outcomes must be answered. Robust study design, appropriate analytic strategies, and addressing important systems issues and clinical endpoints are important for influencing widespread policy change.

**TUHINA NEOGI**, MD, FRCPC,

Clinical Epidemiology Research and Training Unit,  
Boston University School of Medicine,  
A203, 715 Albany Street, Boston, Massachusetts 02118;

**JEROAN J. ALLISON**, MD, MS,

Division of General Internal and Preventive Medicine,  
Department of Medicine,  
Center for Outcomes and Effectiveness Research and Education, and  
Center for Education and Research on Therapeutics of Musculoskeletal Disorders,  
University of Alabama at Birmingham,  
Birmingham, Alabama, USA

Address reprint requests to Dr. Neogi. E-mail: [tneogi@bu.edu](mailto:tneogi@bu.edu)

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