

# Guideline Promotion Increases Prescription of Bone Protection with Steroids in Hospitalised Patients

## Abstract:

L Harty, J Clare, D Finnerty, S van der Kamp, F Kennedy, I Callanan, MJ McKenna, O FitzGerald  
St Vincent's University Hospital, Elm Park, Dublin 4

## Abstract

Guidelines for the prevention of glucocorticoid (GC) induced osteoporosis (GIOP) were implemented in a level 5 Irish Hospital with cross sectional audit of inpatient prescribing undertaken before and after. Prior to guideline implementation, elemental calcium (Ca) with Vitamin D (VitD) was prescribed for 11/66 (17%) of patients on GCs with 2/66 (3%) also receiving bisphosphonate (BP) therapy. Subsequent to guideline implementation, Ca with VitD was prescribed for 19/55 (35%) of patients on GCs with 11/55 (20%) also receiving BP therapy, representing a 2 and 6 fold respective increase. Internal promotion of guidelines is an effective strategy for healthcare improvement but needs refinement with or without repetition to achieve better patient outcomes.

## Introduction

Therapeutic GCs rapidly decrease bone mineral density, inducing a remodelling imbalance by promoting osteoclast differentiation and activation and by inhibiting osteoblasts. Current guidelines suggest that BP therapy together with Ca and VitD should be given at initiation of GC therapy, as it is known that bone remodelling imbalance occurs early with steroid usage. After auditing existing practice, we circulated these guidelines within our hospital and one year later we sought to measure the efficacy of our intervention by completing an audit loop.

## Methods

A cross sectional audit was performed of all adult medical and surgical inpatients in a level 5 hospital. Prescribed GC and concurrent anti osteoporotic medication were noted. Subsequent to the initial audit, guidelines promoting the use of BPs, Ca and VitD when prescribing GCs were advertised on hospital notice boards, in hospital bulletins and prescribing guidelines and also on the hospital website. One year after promoting these guidelines, the audit loop was completed by performing a repeat cross sectional audit.

## Results

All in-patient medical records (n=417) were reviewed in Jan 2010. 52% of the inpatients were female and 58% were older than 65. 66/417 (16%) inpatients had been prescribed GCs. Ca with VitD was prescribed in 11/66 (17%) of patients on GCs with 2/66 (3%) also receiving BP therapy. 3% of patients were also receiving post menopausal hormone replacement therapy. Current ACR GIOP prevention guidelines promote BP prescription for all postmenopausal female or male patients > 50yrs on =7.5mg prednisolone per day (see Figure 1). In Nov 2011 one year after guideline publication, all 452 inpatient medical records (n=452) were reviewed. 63% of the patients were female and 60% were older than 65. 55/452 (12%) inpatients were prescribed GCs. Ca with VitD was prescribed for 19/55 (35%) of patients on systemic steroids with 11/55 (20%) also receiving BP therapy. However 65% of patients on systemic steroids continued to receive no bone protection and 80% received suboptimal bone protection from GIOP.

## Discussion

Fracture ensues beyond 3 months of initiation of chronic GC treatment in 25-60% patients.<sup>2,3</sup> Risk of non-vertebral fracture has been shown to increase from 1.6/100 person years to 2.0/ 100 person years within 3 months of GC initiation. Between 12-16% of our inpatients were prescribed GCs indicating the major clinical significance of GIOP awareness across all medical specialities. GIOP has a rapid initiation phase with up to 15% bone mineral density loss in the first few months of therapy. Publication and advertisement of current bone protection guidelines when prescribing GCs resulted in a substantial but suboptimal improvement by hospital doctors in our hospital in the co-prescription of bone protecting drugs to prevent GIOP. In this audit it appears that the majority of prescribers following guideline implementation do recognise the necessity to protect bone health when a patient requires steroids. The resultant improvement in the co-prescription of Ca & Vit. D and BPs with GCs by the order of 2 and 6 respectively can be attributed in part to the circulation of hospital guidelines. However 65% of patients did not receive any bone protection.

Currently it is recommended that both Ca and VitD along with an anti-resorptive agent should be co-prescribed not only from the time of steroid initiation but also for the entire duration of steroid therapy. Despite significant advances in the understanding of GIOP and the widespread availability of preventative therapies, a substantial proportion of patients receiving GCs, still do not receive appropriate prophylaxis to prevent it. It is our perception that many physicians are not aware that even short courses of steroids reduce bone mineral density and therefore greater efforts must be made to enhance doctor awareness of the necessity for bone protection to be prescribed at initiation of systemic steroids. With this in mind, we have shown that in hospital guideline advertisement improves physician awareness of implemented guidelines. Further improvement is possible with electronic solutions needing to be explored. Electronic prescribing could facilitate appropriate prompting of prescribers. Social media and smart phone applications could increase dissemination of guidelines and both patient education and nurse monitoring services using electronic databases could all increase guideline adherence.

Correspondence: L Harty  
Department of Rheumatology, AMNCH, Tallaght, Dublin 24  
Email: lenharty@outlook.com

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