ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 9, Suppl. 1, 2016

Online - 2455-3891
Print - 0974-2441

Case Report

A CASE REPORT OF NADROPARIN INDUCED HYPERKALEMIA

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Received: 27 May 2016, Revised and Accepted: 01 June 2016

ABSTRACT

Nadroparin, a low molecular weight heparin, has prophylactic and therapeutic use in thromboembolic disorder. In a patient with carcinoma ovary stage 3 B, nadroparin was given prophylactically for deep vein thrombosis (DVT) before and after interval cytoreduction surgery. Nadroparin 0.3 ml was given subcutaneously once daily for 1 day preoperatively and 8 days postoperatively. Rise in serum potassium was observed on the third post-operative day suggestive of hyperkalemia. Intravenous fluids were given, and the drug was stopped on the 9th post-operative day and hyperkalemia resolved after 2 days. Monitoring of serum potassium level is essential when Nadroparin is administered prophylactically for more than 7 days for DVT. As this case illustrates a causal relationship between nadroparin and hyperkalemia, caution must be exercised with nadroparin.

Keywords: Nadroparin, Hyperkalemia, Thrombosis.

INTRODUCTION

Heparin, an anticoagulant, is used in prophylaxis and treatment of deep vein thrombosis (DVT), pulmonary thromboembolism, and post-myocardial infarction. It is now being replaced by low molecular weight heparin (LMWH) in view of better bioavailability, efficacy, less frequent dosing, and no requirement of a partial thromboplastin time monitoring. Known side effects of heparin are osteoporosis, skin necrosis, hypersensitivity reactions, thrombocytopenia, and hemorrhage. LMWH has lesser side effects giving it an advantage over heparin [1]. Hyperkalemia is a common clinical condition defined as serum potassium concentration exceeding 5 mmol/L.

We report a case of hyperkalemia induced by nadroparin used for post-surgical DVT prophylaxis in a patient with advanced carcinoma ovary.

CASE REPORT

A 49-year-old female (informed consent obtained) a known case of carcinoma ovary was planned for cytoreduction interval surgery after 3 cycles of neoadjuvant chemotherapy with paclitaxel. As a measure of DVT prophylaxis patient was started on LMWH 0.3 ml subcutaneous once daily 24 hrs before surgery. Pre-operative evaluation was normal, and serum electrolyte levels were within normal limit. 3 days after receiving nadroparin there was an alteration in the serum potassium level with a significant rise above the baseline with K^+ values rising from 3.8 to 5.6 mmol/L. Here, the baseline K^+ value is considered to be 3.5-5 mmol/L. Nadroparin was continued until 8th post-operative day. As a part of intervention intravenous fluid correction was given and nadroparin on was stopped on 9th post-operative day and serum K^+ values returned to normal to baseline after 2 days of stopping nadroparin (Table 1).

Review of the case revealed that patient was not on any other medication other than nadroparin that could predispose to hyperkalemia. Renal insufficiency or diabetes that could cause hyperkalemia was excluded. The patient was asymptomatic with normal electrocardiogram and vitals.

Table 1: Serum potassium levels

08/09/2015	3.8 mEq/L
12/09/2015	5.6 mEq/L
19/09/2015	4.2 mEq/L

DISCUSSION

Drug-induced hyperkalemia is one of the most common causes of hyperkalemia in hospital setting in everyday practice. A wide range of drugs can cause hyperkalemia by a variety of mechanisms like promotion of transcellular shift of K^+, by impairing K^+ excretion or increasing K^+ supply. A high risk of hyperkalemia is seen in those having hypoaldosteronism, chronic renal insufficiency, and taking medications that can increase K^+ levels. Recognition of medications that impair potassium homeostasis is essential for proper clinical care and management [2].

Unfractioned and LMWH are used in the management of medical and surgical diseases. Hyperkalemia, a rare but recognized side effect with lower incidence due to LMWH in comparison to incidence of 7% with heparin is usually overlooked in clinical practice [3]. However, there are no conclusive reports on LMWH induced hyperkalemia and its incidence cannot be actually defined. The mechanisms by which heparin produces hyperkalemia is still debatable but various mechanisms put forth are inhibition of enzyme involved in synthesis of aldosterone, namely 18-alpha hydroxylase, reduction in number as well as affinity of angiotensin II receptors in zona glomerulosa. Heparin causes marked reduction in width of adrenal zona glomerulosa thereby leading to aldosterone suppression. Aldosterone suppression results in natriuresis and decreased excretion of potassium leading to hyperkalemia [4-6].

A risk of heparin-induced hyperkalemia is higher in patients with preexisting diabetes mellitus, renal failure, patients on potassium sparing drugs where K^+ levels should be measured before and after initiating heparin treatment [4-6]. Clinical studies [3,4,7-9] have been published on this issue, the latest being the work of Torres *et al*. reflecting the continued clinical implication of this rare but relevant complication [7]. Potassium monitoring is important in the case of treatment with heparin for more than 7 days. However, hyperkalemia can still occur within a span of 3 days as in this case. Causality assessment as per, Naranjo's scale [10] indicates the adverse effect to be probable due to nadroparin.

CONCLUSION

This case illustrates the need of cautious administration and monitoring of serum potassium levels in post-surgical DVT prophylaxis patients receiving nadroparin for more than a week. Monitoring of levels on the

4th day after initiation of nadroparin is recommended. Now that LMWH is preferred over heparin, so it becomes imperative to monitor K^+ levels regularly.

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