Case Report

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Vitamin K induced anaphylactic reaction in a child: a case report

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ABSTRACT

Vitamin-K is commonly indicated in pediatric patients with coagulation disorders, hepatic disease, warfarin toxicity, sepsis-induced disseminated reaction. Minor complications are very well known, but anaphylactic reactions are rarely reported in children. We present a case of a 13-year-old child who developed anaphylactic reaction following intravenous administration of Vitamin-K. He was managed with Inj. Adrenaline 0.35mg IM, Inj. Avil 22mg IV slowly over 20 mins, Nebulization with salbutamol 1mg. The reaction was most probably due to an anaphylactic reaction to Vitamin-K.

Keywords: Anaphylactic reaction, Causality, Vitamin-K

INTRODUCTION

Vitamin K is an essential fat-soluble vitamin which is commonly used for prophylactic administration at birth and for children with hepatic failure induced coagulation malabsorption disorders. syndromes, coumarin overdosing. It is required for post-translation modification of coagulation factors II, VII, IX, X and proteins C and S, the natural inhibitors of coagulation. The vitamin K dependent step is gamma-carboxylation of a variable number of glutamate residues by carboxylase which utilizes the vitamin as a cofactor. During the reaction, Vitamin-K is oxidized to Vitamin-K 1, 2, 3 epoxides, a biologically inactive metabolite that must be reduced back to vitamin by a microsomal epoxide reductase.1 The pathogenesis of vitamin-K induced anaphylactoid reaction is unknown and may be multifactorial with the etiology of vasodilation induced by solubilizing vehicle or immune-mediated reaction.² Here, we report an anaphylactoid reaction occurred immediately after administration of Vitamin-K in a 13year old child.

CASE REPORT

A 12-year old male child complains of fever, loose stools 2-3 episodes/ day i.e; watery in consistency, yellow in color, abdominal pain dull aching in nature in the epigastric region associated with decreased activity and oral intake for 2 days. On examination, tenderness was noted in the epigastric region and icterus was present. Results on laboratory investigations were USG: Mild Hepatospleenomegaly and mild ascites, Widal Test: Positive (O: 1:80 and H: 1:160), Blood culture report: Salmonella typhi was present. Elevated CRP: 1.2. On stool Examination: Nonpathogenic organism E. coli was isolated. Results of Liver Function include: T. Bilirubin: 3.7 mg/dl (Direct Bilirubin: 3.1 mg/dl, In-Direct Bilirubin: 0.6mg/dl) and SGOT- 253U/L, SGPT- 263U/L, ALP- 561U/L. On Urine Analysis: Specific Gravity-1.015, Albumin-++, Ketone Bodies-++, Epithelial Cells: 2-3/hpf, Pus cells:2- 3/hpf, RBC- 11-12/hpf. Based on these clinical findings he was diagnosed as Enteric fever and was prescribed with following Drug therapy: Inj. Ceftriaxone- 100mg/kg/day IV BD, Tab. Paracetamol-500mg PO SOS, Inj. Paracetamol- 5mg/kg/dose IV BD,

Darolac Sachets 1 sachet PO BD, Zn and D drops PO OD, Inj. Pantop- 40mg IV OD, Tab. Doxycycline-5mg/kg/day PO BD. Based on elevated LFT the child was recommended with Inj. Vitamin-K 5mg IV OD for 3 days. On day 2 the child complains of increased difficulty in breathing and chest tightness, chills all over the body, reeling sensation and vitals on physical examination were abnormal with HR- 160b/min, RR- 35cycles/min, B.P-50/100mm of hg so, Inj. Vitamin K was immediately withdrawn as it was considered as Vitamin-K Induced Anaphylaxis and was managed with Inj. Adrenaline-0.35mg IM OD, Inj. Avil- 22mg IV slowly over 5 mins, nebulization with salbutamol- 1ml. She recovered and thereafter and was discharged on the 7th day of admission.

DISCUSSION

Anaphylaxis reactions to intravenously administered Vitamin-K patients have been reported in the literature. Commercial preparations of Vitamin-K are available for medicinal purpose from 1953. Since then, there have been many reports of adverse effects. Serious reactions are rare, although the exact incidence of serious side effects such as an anaphylactic reaction, anaphylaxis reactions are not known in the pediatric age group and are less reported. Anaphylaxis reaction to Vitamin-K was confirmed by performing causality assessment.

This was because there was no previous exposure of Vitamin-K to the patient and the reaction happened immediately after injection as well as the reaction could not be explained by other drugs or disease in this child. Riegert-Johnson and Volcheck conducted a retrospective study for 5-year to assess the incidence of adverse reactions due to administration of Vitamin-K and found that 3 per 10,000 doses showed fatal effects. A literature review by Fiore LD, Scola MA revealed a total of 23 cases (3 fatal) of anaphylactoid reactions upon administration of intravenous Vitamin K.5

A total of 2236 adverse drug reactions were reported by taking Vitamin-K administered by all routes in 1019 patients as per the FDA database. Out of the 192 patients who showed adverse drug reactions with intravenous vitamin K, anaphylaxis was observed in 132 patients (69%) and fatalities were 24 patients (18%). In patients who were administered with less than 5mg of intravenous vitamin-K 21 showed anaphylaxis reactions and 4 fatalities were reported. For the remaining 217 patients

who were administered with vitamin-K via a non-intravenous route of administration, anaphylaxis was observed in (18%), and 1 fatality (3%).⁵

CONCLUSION

Vitamin K is an important factor for maintaining coagulation, commonly indicated for hepatic failure, coagulation disorders, bleeding secondary to coumarin agents, and also used as prophylaxis for prevention of hemorrhagic disease of the newborn. Adverse reactions are common but fatal ones are rare. In a child aged 13 years vitamin K injection caused anaphylactic reaction immediately after administration and patient recovered after withdrawal.

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