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CASE REPORT

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Eosinophilia; side effect of vancomycin which is not often detected: Case report

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Abstract

In recent years, medication-related diseases have become a major concern in elderly care. Elderly people tend to experience more negative drug events than younger patients due to accompanying diseases, multiple drug use, and age-related changes in pharmacodynamics and pharmacokinetics of drugs. Vancomycin is a nephrotoxic and ototoxic antibiotic commonly used in gram (+) bacterial infections, especially in Methicillin-resistant Staphylococcus aureus (MRSA), which can cause important problems such as flushing, muscle spasm, redman syndrome. It was aimed to report vancomycin drug reaction, which emerges of elevated eosinophilia.

Keywords: Vancomycin, methicillin-resistant, eosinophilia, intensive care, medication-related

Introduction

In recent years, medication-related illnesses have become a major concern in elderly care. Elderly people tend to experience more negative drug events than younger patients due to accompanying diseases, multiple drug use, and age-related changes in pharmacodynamics and pharmacokinetics of drugs [1,2]. The most common drug reaction findings are on skin-mucosa (80-90%), and it is followed by respiratory system (40-70%), cardiovascular (10-45% -hypotension, tachycardia, bradycardia, dysrhythmia, shock, syncope, chest pain, arrhythmia, cardiac arrest), gastrointestinal (30-45%) and neurological findings (10-15%) [3]. Adverse effects related to drugs include; fixed drug eruption, Stevens-Johnson syndrome, toxic epidermal necrolysis, juvenile pemphigus, juvenile associated bullous pemphigoid, juvenile linear immunglobuline A dermatosis, juvenile pseudoporphyria, acute generalized exanthematous pustulosis, phototoxic drug reactions, bromoderma, dermal and acral erythema [4], neutropenia, fever, phlebitis, nephrotoxicity, ototoxicity, thrombocytopenia, interstitial nephritis, lacrimation [1], ST elevated MI and cardiac arrest [3,5]. Vancomycin is a nephrotoxic and ototoxic antibiotic commonly used in Gram (+) bacterial infections, especially in methicillin-resistant Staphylococcus aureus (MRSA), which can cause important problems such as flushing, muscle spasm, and redman syndrome. Vancomycin can cause severe hypotension, shock, and sudden cardiac side effects, especially in rapid infusion [5]. It was aimed reporting vancomycin drug reaction, which emerges with eosinophilia.

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Case Report

A 76 years old male patient was admitted to intensive care unit with pneumonia diagnosis. The patient has been treated with antibiotic drugs. There were known chronic obstructive pulmonary disease (COPD) and cardiac arrest in medical history. High urea-creatine levels, pleural effusion and hypoxic brain damage were existing. The patient was not co-operating.He had been on going treatment of enoksaparin, budesonid, flutikazon propiyonat, metil prednisolone for a long time (longer than hospitalisation). Blood and bronchoalveolar lavage cultures were taken because tracheostomy was followed by mechanical ventilation, fever existed and biomarkers pointing to infection (C-reactive protein, procalsitonin) did not decrease despite antibiotherapy. Because of Staphylococcus epidermidis recurrence in blood culture, vancomycin was administered 1x1 gr/48 hours intravenous treatment. Tachycardia and hypotension were observed on the 3rd day of the patient's treatment. There was no response to fluid replacement, fever continued. An eosinophil increase was detected in complete blood count test. Treatment with vancomycin was stopped because of the allergic reaction due to increased eosinophilia. Skin rash was not detected in the patient. The remarkable increase in eosinophil counts and ratios was observed on the 3rd day of treatment. Twenty-four hours after the cessation of treatment, tachycardia and hypotension regressed. On the 7th day of treatment, the eosinophil count and ratios were at the highest level and the treatment was stopped and the number of eosinophils in the complete blood count decreased to 0 on the following 3 days.

The increase in eosinophil counts and rates on the third day of treatment is striking. On the 7th day of treatment, treatment was stopped when the eosinophil count and rates were at the highest level, and the number of eosinophils in the complete blood count decreased to 0 in the following 3 days. See Table-1

Table 1. Leukocyte, basophil, eosinophil, lymphocyte, neutrophil counts according to day of treatment

Day of vancomycin treatment	Leukocyte count(/µL)	Basophil count (/µL)	Basophil rate(%)	Eosinophil count (/µL)	Eosinophil rate(%)	Lymphocyte count (/µL)	Lymphocyte rate(%)	Neutrophil count (/µL)	Neutrophil rate(%)
Before treatment	20700	80	0,4	0	0	2590	12,5	0	0
3rd day of treatment	32380	50	0,2	3900	12	7600	23,5	18860	58,2
7th day of treatment (cessation)	23140	50	0,2	4700	20,3	3050	13,2	13890	60
10th day of treatment	28300	60	0,2	0	0	4570	16,1	0	0

Discussion

Medication-related illnesses are a major concern because of the possibility of adverse drug reactions in elderly care, comorbid diseases, multiple drug use, and age-related changes in the pharmacodynamics and pharmacokinetics of drugs, which are less likely to occur in younger patients. The patient's clinical appearance showed that hemodynamic effects and laboratory findings should be carefully observed in drug reactions as well as skin lesions. It was thought that the presence of COPD in the case and the use of steroids in treatment have masked the findings of physical examination. Atalan et al, have reported that they used paracetamol, diphenhydramine, and prednisolone in the treatment of adverse drug reactions. The patient had already been under paracetamol and prednisolone treatment because of fever due to infection and COPD. Although we carefully examine multidrug treatment in the intensive care unit, it is not possible to limit the number of medicines after a point.

Although vancomycin is safe in therapeutic serum concentrations, it may cause many side effects such as neutropenia, fever, phlebitis, nephrotoxicity, ototoxicity, thrombocytopenia [1]. Drug Rash with Eosinophilia and Systemic Symptoms (DRESS) syndrome has also been described as a violent reaction accompanied by drug-induced, cutaneous, hematological and solid organ involvement [6]. Eosinophilia and systemic symptoms (tachycardia and hypotension) were observed but we could not define our case as DRESS syndrome because cutaneous symptoms and solid organ involvement were not observed. We had previously stated that the skin signs may have been masked by paracetamol and prednisolone treatment. In addition, the age of the patient and the duration in intensive care unit may suggest that the physiological response may be weak. At this point, it is the most obvious finding that solid organ involvement has not been presented, and has made us wander away from the diagnosis of DRESS syndrome.

Major side effects of enoxaparin include; edema in the face, tongue or throat, difficulty in breathing, red patches in the hip area particularly on the legs, wide ecchymosis, tenderness in the abdomen or a severe headache [7]. These findings had not been observed in the patient.He had the tracheostomy and no dermal findings were present.

Long-term use of high-dose inhaled corticosteroids therapy has potential to cause systemic side effects such as impaired growth in children, decreased bone mineral density, skin thinning and bruising, and cataracts [8]. Patient has also been treated with intravenous steroids.Bone mineral density has not been measured during intensive care admittance because no indication occurred. Skin thinning and cataracts were not detected. Hyperglycemia has been detected and treated with insulin infusion with the suggestion of endocrinology.

Fluticasone propionate has been reported a dose-related suppression of plasma cortisol, oral candidiasis, hypersensitivity reactions, angioedema, Cushing's syndrome, hyperglycemia, psychiatric diseases [9,10]. Oral candidiasis, hypersensitivity reactions, angioedema have not been observed in the patient, plasma electrolyte levels were in normal range, hyperglycemia has been detected rarely and has been thought to be correlated with steroids rather than fluticasone propionate.

Neutrophilia accompanies eosinophilia in complete blood counts, that it has been thought to be related to infection. However, leukocytosis has not accompanied, it was thought to be caused by age and multidrug treatment (especially steroids).

Ethiology of eosinophilia includes; parasites, protozoans, allergic diseases (hay fever, asthma, angioneurotic edema, allergic vasculitis), dermatitis (Psoriasis, pityriasis, pemphigus), hypereosinophilic syndromes (Eosinophilic leukemia, Loeffler syndrome, polyarteritis nodosa), gastrointestinal disorders (Eosinophilic gastroenteritis, ulcerative colitis, Crohn's disease), tumors (Carcinomatosis, brain metastasis, melanoma, Hodgkin's disease and lymphoma, myeloproliferative syndromes) and hereditary eosinophilia [11]. The patient has not had parasites, myeloproliferative syndromes, hereditary eosinophilia, dermatitis or detected tumors.He had COPD and eosinophilia is not expected to occur. Lymphadenopathy was not detected also.

Conclusion

Tavakoli-Ardakani et al. have reported that pharmacist intervention had seen a significant improvement in the proper initiation of vancomycin treatment but treatment continued despite negative cultures [12]. Pharmacist assistance is not routinely taken in our clinic. We have not made such an evaluation in our case and inclusion of this practice in the routine can be evaluated in order to improve our clinical practice. Elderly patients with chronic disease who were followed up in intensive care units may not be able to represent any physical examination findings because of their multiple drug treatment. We are convinced that careful examination of laboratory tests and all other parameters will result in less negative drug reactions on behalf of patients.

Conflict of interest

There is no conflict of interest related to the study.

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