Case Report

Antidote Treatment in Digoxin Intoxication and Intensive Care Management

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Abstract: Digoxin is a frequently used cardiac glycoside. As its theuropatic range is narrow, digoxin intoxication is one of the most frequently occurring intoxications. It presents with cardiovascular, gastrointestinal and neurological symptoms and signs. When serum level exceeds 2 ng/ml, findings associated with toxicity start to appear. The aim of this report is to present a case in whom life threatening arrhythmias developing after 2.5 mg use with suicidal intent and current treatment approach.

Keywords: Digoxin, cardiac glycoside, arrhythmias, intoxication.

INTRODUCTION

Digoxin is a Na-K ATPase inhibitor which has been used in the treatment of heart failoure for about 200 years and is derived from the plant termed 'digitalis purpurea'. It exerts positive inotropic effect by increasing the amount of intracellular calcium and negative chronotropic effect by decreasing sympathetic activation. Digoxin blood levels is expected to be between 0.5 ng/ml - 1.1 ng/ml. Since its therapeutic range is narrow, the use of digoxin accidentally or for suicidal intent may easily lead to acute intoxications. It may influence many systems, starting especially with cardiac system, neurological and gastrointestinal systems. The aim of the present case is to share our experience with arrhythmia developing after digoxin use with suicidal intent and the efficacy of digoxin antidote used in treatment.

CASE REPORT

A 69 year old female patient was brought to emergency service after receiving 2,5 mg digoxin for suicidal aims. At admission to hospital, her blood pressure values were 130/80 mmHg, heart rate (HR) 60 beat/min. , and respiratory rate (RR) 17 /min. Glascow coma scale (GCS) score was 15 and blood gas values were pH: 7.4, pCO2: 23, pO2: 85, HCO3: 17 and SO2: 98. Nasogastric catheter was placed and after stomach irrigation, active cola was administered and the patient was admitted to our intensive care unit. The patient was monitorized and ECG was taken, arterial fibrillation and long R-R distance (>2sec.) were found and cardiology

department was consulted. Temporary pacemaker was implanted by cardiology department. Biochemical investigation results were as follows: potassium (K) :4.7mEq/L, sodium (Na) :133mEq/L, magnesium (Mg): 2mEq/L, digoxin level>8 ng/ml. As digoxin level was very high, national posion consultation center was contacted. Digoxin antidote Digifab was supplied by cold chain. Patient was administered digifab with the evaluation of digoxin and K levels every six hours. 24 hours later, digoxin level was reduced to 6.8 ng/ml, and 48 hour later to 4.2 ng/ml. Arrhythmias decreased and cardiology reevaluated the patient and pacemaker was removed. General condition improved rapidly and digoxin level fell to as low as 1.7 ng/ml 72 hours later. In monitorization, K level was measured every six hours. K level was high and following the administration of Fab, a rapid decrease occurred in K level by 3.0 mEq/L within 12 hours of the administration of Fab. In order to prevent the fall in potassium, controlled K was administered. On the 4th day of monitorization, blood gas, digoxin level and vital findings became stable, and patient was discharged with recommendations upon evaluation by psychiatry department.

DISCUSSION

Digoxin is a cardiac glycoside which is primarily used in the treatment of heart failure with systolic dysfunction [1]. As therapeutic range is narrow, intoxication may readily develop not only in use with suicidal intent but also in normal use [2,

3].Accompanying electrolyte disturbances makes it easier for the drug to reach toxic dose. Electrolyte disturbances , which may lead to this condition, should be corrected [4]. In these intoxications whose cardiovascular symptoms are predominant, bradycardia, atriventricular block and arrhythmias may develop and these patients may undergo transient pacemaker placement until rhythm has become strong enough to maintain normal hemodynamic level, which is life-saving. In patients who do not respond to treatment or have severe arrhythmia, as in our patient, digital binding antibodies (FAB) may be used in treatment [5].With the administration of this antidote, digoxin - FAB antibody complex is formed and it is excreted with urine. 1 digifab contains 40 mg antidote and reduced digoxin level by 0.4ng/dl. Actually, in the present case, digoxin level was reduced dramatically following the administration of FAB.

In conclusion, it is our suggestion that electrloyte disturbances which occur in acute digoxin intoxication should be monitorized closely and in these arrhythmias with very high mortality rates, successful results can be obtained with active intervention using FAB.

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