

HEMOPERFUSION TREATMENT OF DIGITALIS INTOXICATION IN CHRONIC HEMODIALYSIS PATIENT

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Diagnosis of Digitalis intoxication depends on good history taking, clinical signs and symptoms, and digoxin level. Sixty one years old female with diabetes mellitus (DM), coronary artery disease (CAD) and end-stage renal failure administered to emergency department with complaints of dyspnea and chest pain. Digoxin 0.50 mg once a day was prescribed by an internal medicine physician and she has been taking the drug for 7 days. In our case digoxin level was decreased to valuable level after hemoperfusion. In conclusion it was observed that hemoperfusion therapy of digitalis intoxication in chronic hemodialysis patient is effective.

Key words: Digitalis, intoxication, chronic renal disease, hemoperfusion treatment.

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INTRODUCTION

Digitalis is used in chronic heart failure to increase the contractility of ventricles and is useful in atrial fibrillation and flutter in controlling ventricular rate. It is important to notice that digitalis intoxication may also cause similar arrhythmias. Digitalis inhibits 10-30% of Na-K-ATPase activity at the therapeutic dosage. At toxic dosage more than 30% of the Na-K-ATPase activity is affected and as intracellular electrolyte imbalance occurs, intoxication is seen (1).

Following heart kidney is the organ that glycosides mostly accumulate and 60% of digitalis are excreted by kidney. Therapeutic plasma level of digitalis is 0.8-2 ng/ml. In older patients in cases of decreased distribution volume, decreased body mass and renal clearance, loading a continuous dosages should be reduced. In such cases, half life of the digitalis may be longer than 73 hours (2).

In case with chronic renal disease, due to increased half life and decreased renal clearance of digitalis, they should be used in lower dosages. In severe renal insufficiency loading dose should be decreased to 30-50% of normal dosage. Half life of digitalis may prolong from 1.6 to 4.4 days in kidney disease. For this reason continuous dosage should be

kept between 0.065-0.125 mg and close plasma level follow up is recommended (2,3).

Conditions increasing digitalis effect, criminal usage (such as suicide) and incorrect dosage may play role in the etiology of digitalis intoxication association. Clinical symptoms of digitalis intoxication are gastrointestinal symptoms such as nausea, vomiting, diarrhea, anorexia; neurological symptoms like delirium, confusion, yellowish to green vision; cardiac arrhythmias such as sinus bradycardia, paroxysmal atrial tachycardia, nodal tachycardia, ventricular arrhythmias and conduction problems (mostly mobitz type 1 and second degree atrioventricular block) (1-3). Williamson et al. reported that common ECG findings of digitalis intoxication are 33% A-V block, 24% bradycardia, 15% junctional tachycardia and 12% atrial fibrillation (1).

In our study we aimed to report the results of hemoperfusion treatment on chronic hemodialysis patients with digitalis intoxication.

CASE

Sixty one years old female with diabetes mellitus (DM), coronary artery disease (CAD) and end-stage renal failure administered to emergency department

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with complaints of dyspnea and chest pain. Digoxin 0.50 mg once a day was prescribed by an internal medicine physician and she has been taking the drug for 7 days. In addition to nausea and vomiting, loss of consciousness was started. Physical examination revealed arterial blood pressure of 160/90 mmHg, pulse rate of 60/min, respiratory rate of 26/min, fever of 37.1°C. The patient was uncooperated and unoriented, her tongue was dry, skin turgor was decreased and respiratory sounds were decreased. Also rales were present. Laboratory results were as follows; glucose 226mg/dl, urea 78mg/dl, creatinin 5mg/dl, Na 140mEq/L, K 4.8mEq/L, Ca 10.1mEq/L, Mg 2.4mEq/L, hemoglobin 9.7g/dl and plasma digoxin level >6.00 (0.8-2.4ng/mL). Patient was referred to coronary care unit due to digitalis intoxication. Digoxin was stopped and she was monitorized. Third degree A-V block was observed during follow up and pacemaker was applied to patient. After dehydration was treated, rhythm was normalized and pacemaker was removed. Patient was hemoperfused with GAMBRO ADSORBA 300 C active carbon filter. Hemoperfusion was done for 4 hours intervals one. In first hemoperfusion level of digoxin was dropped from >6.00 to 5.4. After second hemoperfusion the level was dropped from 5.4 to 4.6. During follow up complaints of the patient was decreased. Digoxin plasma level was dropped to 4.5, we recommended performing hemoperfusion again but patient didn't accept. She went to another health center.

DISCUSSION

Diagnosis of Digitalis intoxication depends on good history taking, clinical signs and symptoms, and digoxin level. Treatment of digitalis intoxication with peritoneal and hemodialysis have low effectiveness but there is also effective methods such as digoxin antibody treatment (2).

After termination of the Fab infusion, there is a rebound increase of digoxin level (3). In patients with end stage renal failure, because of high molecular weight (MW=50000) elimination of antibody is very difficult. Beta 2-microglobulin (β_2 mcg) absorption column used for the treatment of dialysis-related amyloidosis removes serum β_2 mcg by recognition of lipophilic

residue in the protein. Data suggested that the β_2 mcg column selectively adsorbs digoxin and it can be used successfully in digitalis intoxication (4).

Hemoperfusion have some side effects such as decreasing blood pressure, platelets, red blood cells and proteins, but in our case no problem observed.

There are few experiences about hemoperfusion treatment and digital intoxication in chronic renal failure patients. Achenbach H et al. reported 4 patients after suicidal ingestion of digitalis. They performed hemoperfusion treatment lasting 4 to 6 hours and observed that clinical symptoms and existing disturbances of cardiac rhythm were clearly positively influced under perfusion. They also noted that in no case clinical complications were observed (5).

In our case digoxin level was decreased to valuable level after hemoperfusion. There is no real treatment in digoxin intoxication in chronic renal failure patient. In our case after hemoperfusion complications of digoxin intoxication were decreased and no side effect was observed. There wasn't rebound increase of digoxin level after treatment.

In conclusion it was observed that hemoperfusion therapy of digitalis intoxication in chronic hemodialysis patient is effective.

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