Effect of glutathione on the cadmium chelation of EDTA in a patient with cadmium intoxication

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Introduction: Chronic cadmium intoxication is worldwide, but the managements of chronic cadmium toxicity are challenging, and there are no specific effective treatment modalities. We hypothesize that in use of Ca++-EDTA chelation, combination therapy of glutathione has the increased level of cysteine as well as pool of sulphydryl group amino acids.

Case report: A 54-year-old man visited with generalized bone pain of worsened at night and relieved at day time, he had worked at the factory producing compressors for air-conditioners over past 24 years.

Experimental treatment With the patient’s consent, he was administered 500mg of Ca++-EDTA and 50mg/kg of glutathione alone or in 1 L of normal saline over the next 24 hours, and was repeated this over 12 consecutive days. During the first three days the basal levels (only saline administration) were determined; during the second three days Ca++-EDTA only was administered, for the third sequence of three days Ca++-EDTA with glutathione was provided, and for the last three days glutathione alone was given. One month later, the same protocol was repeated. Six-time blood and urine samples were performed to analyze in each group.

Results: The blood cadmium level was more higher when EDTA was infused together with glutathione (7.44±0.73 μg/L, p<0.01) compared to the basal level of 4.6±0.44 μg/L. Also, the renal cadmium excretion was significantly higher in the EDTA with glutathione group than in the basal group (23.4±15.81 μg/g creatinine vs. 89.23±58.52 μg/g creatinine, p<0.01). There was no difference in the protein/creatinine and β2-microglobulin/creatinine ratio in the urine (p>0.05) among the groups. Furthermore, microhematuria and proteinuria did not develop over the observation period of six months.

Conclusion: The chelation for Chronic cadmium intoxication has not been recommended for a number of reasons as no evidence of long-term improvement, increased risk of redistributing cadmium to other organs, ineffectiveness for removing significant amounts of cadmium. We suggest that glutathione administration with EDTA might provide a safe and effective chelative treatment modality for patients with cadmium intoxication.

Two Cases of Emphysematous Cystitis in Maintenance Hemodialysis Patients

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Emphysematous cystitis is uncommon disease associated with gas in the bladder wall and cavity. In ESRD patients, emphysematous cystitis is rare, mainly due to collapsed bladder mucosa and tight fibrous mucosa. There have been only 2 cases of emphysematous cystitis in ESRD patients. We experienced two cases of emphysematous cystitis in HD patients including one patient with total anuria. A 60-year-old diabetic man presented with bloody urethral discharge and pain for 2 days. The vital sign was stable without fever. Peripheral blood white blood cell count was 18,100 cells/mm³ with 88.4% of neutrophils and hsCRP was 1.07 mg/dL. Bladder washing showed many WBCs and RBCs on microscopy. A pelvic X-ray showed vague circumferential air in the bladder wall and pelvic CT scan revealed severe bladder wall thickening with intramural gas. He was treated with ceftriaxone 2 g a day. Cystoscopy revealed bullous change with erythematous lesion and congestion. Culture of bladder washing showed E. coli which was sensitive to ceftriaxone with atypical urothelial cell on cytology. The WBC normalized with 11 days IV antibiotics, and he was discharged on oral Cefixime. A 73-year-old diabetic patient visited the clinic due to gross hematuria for 3 days. The vital sign was stable without fever. WBC was 9,200 cells/mm³ with 65.0% of neutrophils and increased hsCRP (3.4 mg/dL). Urine microscopy showed many RBCs and WBCs with a few epithelial cells. The pelvic X-ray and CT showed air in urinary bladder. He was treated with meropenem 0.5 g every day. Urine culture showed E. coli with positive ESBL. The patient discharged after 9 days of parenteral antibiotics. These cases suggest nephrologists should consider emphysematous cystitis in the differential diagnosis of hematuria in HD patients, even when the patient is anuric.