Acute Renal Failure and Acute Necrotizing Pancreatitis after *Echis Carinatus Sochureki* Bite, Report of a Rare Complication from Southern Iran

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Abstract: Venomous animal bites are a significant health problem for rural populations in many parts of the world. Herein, we report an unusual presentation of *Echis carinatus sochureki* bite from southern Iran. A 36 year old woman was referred to Shiraz Nemaze Hospital due to anuria, headache, gastrointestinal bleeding, nausea and vomiting and severe abdominal pain after *Echis carinatus sochureki* bite. According to the clinical and paraclinical evaluations, the patient was admitted with impression of acute renal failure and acute pancreatitis. Acute pancreatitis is a rare complication after snake bite. This article is the first report of acute pancreatitis after *Echis carinatus sochureki* bite.

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Introduction

Venomous animal bites are a significant health problem for rural populations in many parts of the world (Warrell, 1992). Envenoming can cause local effects such as pain and infection; and systemic effects, such as shock, myocardial damage, rhabdomyolysis, acute renal failure (ARF) and disseminated intravascular coagulation (DIC) (Chippaux, 1998; White, 2000). Acute pancreatitis is a rare complication after snake bite (Kjellström, 1989). Herein we report an unusual presentation of *Echis carinatus sochureki* bite from southern Iran.

Case report

A 36 year old woman was referred to Shiraz Nemaze Hospital due to snake bite by *Echis carinatus sochureki.* The patient had been completely well, without any underlying disease, till 10 days before admission when she was bitten by a snake and referred immediately to a local hospital in Southern Iran (Hormozgan Province). In the local hospital progressive nausea and vomiting, abdominal pain and anuria started. Then the patient presented headache and severe gastrointestinal bleeding. In laboratory workups hyperglycemia, hypertriglyceridemia and a rise in the body urea nitrogen (BUN), creatinine (Cr) and lactate dehydrogenase (LD) were detected.

So she received 12 vials antivenom (Polyvalent Antivenom, Razi Vaccine and Serum Research Institute, Teheran, Iran) and 6 episodes of dialysis were done for her without any progression in the general condition, so the patient referred to our centre for more evaluations.

On admission in our centre, her blood pressure was 230/110 mm Hg, pulse rate 80/min, respiratory rate 15/min, and temperature was 36.5 °C orally. In the examination of her chest both lungs had diffused expiratory wheezing and in the abdominal exam severe abdominal pain and tenderness were detected at the epigastric area. The patient's extremities were oedematous.

She was uremic (BUN 31.0 mmol/l; Cr 990.0 μmol/l) and had hyperglycemia (random blood sugar 31.8 mmol/l) and hypertriglyceridemia (serum triglyceride 13.6 mmol/l).

Her serum amylase and lipase were raised too (amylase 7.2 μkat/l; lipase 12.27 μkat/l). LD level in serum was increased to 62.5 μkat/l as well.

In complete blood cell count anemia was detected (hemoglobin 75.0 g/l).

Urine analysis showed severe hematuria and liver function test was within the normal range.

In radiologic imagines at our hospital, in ultrasonography both kidneys showed an increase in echogenicity of the cortex and parenchymal damage. Acute necrotizing pancreatitis was detected in the abdominal CT scan. The patient was admitted at the hospital with impression of acute renal failure and acute pancreatitis. She received supportive cares: intravenous hydratation, antibiotic therapy (imipenem), nasogastric tube insertion and hemodialisation for controlling the uremic complications.

In the hospital course uremia, anemia, hyperglycemia and hypertriglyceridemia were revealed gradually. The patient was discharged from the hospital after 30 days of admission in our centre and 11 days admission in the local hospital with an acceptable general condition. In 1 year follow up the patient recovered completely.

Discussion

Envenoming due to snake bite can cause two important effects: local effects, notably tissue necrosis, pain and infection; and systemic effects, including paralysis, haemostatic disturbances, shock, increased capillary permeability, myocardial damage, rhabdomyolysis, acute renal failure (ARF) and disseminated intravascular coagulation (DIC) (Chippaux, 1998; White, 2000; Agarwal et al., 2007; Kim et al., 2008; Zhou et al., 2008).

Symptomatologies of envenoming and eventual incurred complications depend on the composition of venom, its amount and the condition of the patient.

The exact pathogenesis of these complications is not well established. However, a number of factors may contribute such as bleeding, hypotension, circulatory collapse, intravascular hemolysis, microangiopathic hemolytic anemia and direct nephrotoxicity of the venom (Chugh, 1989; Zhou et al., 2008).

Acute pancreatitis, which is rapid-onset inflammation of the pancreas, is a rare complication after snake bite. Depending of its severity, it can have severe complications and high mortality despite the treatment (Kjellström, 1989).

Kjellström (1989) reported a young, previously healthy man who had severe abdominal symptoms after an adder bite. Acute pancreatitis was diagnosed at exploratory laparotomy. He suggested that adder venom contains enzymes which can, at least theoretically, cause acinar cell damage and thus trigger acute pancreatitis.

Moreover Seelig and Seeling (1975) explained the possible role of serum complement system in the formal pathogenesis of acute pancreatitis, cobra venom factor pancreatitis – sodiumtaurocholate and deoxycholate pancreatitis.

Furthermore Aroch et al. (2004) reported the acute necrotizing pancreatitis after fatal *Vipera xanthina palestinae* envenomation in 16 dogs. Another study by Valenta et al. (2010) reported a case of acute pancreatitis after viperid snake *Cerastes cerastes* envenoming.

In this article we report acute pancreatitis after *Echis carinatus sochureki* bite. *Echis carinatus sochureki* is a venomous viper subspecies found in India, Pakistan, Afghanistan, Iran and some parts of the Arabian Peninsula (Mallow et al., 2003).

The venom of the *Viperidae* family contains proteolytic enzymes and polypeptides toxins (such as cardiotoxins, bradykinin and histamine), which cause respiratory failure, arrhythmias and hypotension (Boviatsis et al., 2003).

Also this poison has some proteases, phospholipases, collagenases and thrombin-like enzymes, which interfere with normal blood clotting (Boviatsis et al., 2003).

Phospholipase A2 (PLA2) is present in almost all snake venoms as a basic protein called "direct lytic factor" (Chugh, 1989).

PLA2 is a growing family of lipolytic enzymes that play an important role in various biological processes including lipid metabolism and membrane homeostasis, and in diseases such as acute pancreatitis (Rönkkö et al., 2007).

Moreover it is induces acute pancreatitis when injected into the common bile duct of rats (Camargo et al., 2008).

So in this case we suggest the effect of PLA2 as the cause of acute pancreatitis after snake bite.

Additionally PLA2 plays an important role in the pathogenesis of multiple organ failure associated with acute pancreatitis (Kihara et al., 2005). Accordingly failure in other organs in our patient such as renal failure may be the effect of this factor.

On the other hand, Ogawa et al. (1991) suggested that the imbalance of the collagen metabolism between synthesis and degradation may result in fibrosis in pancreatitis.

So, collagenases in the snake venom may be the cause of fibrosis in pancreatitis in snake bite patients.

This article is the first report of acute pancreatitis after *Echis carinatus sochureki* bite.

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