

CASE REPORT / ПРИКАЗ БОЛЕСНИКА

Total parenteral nutrition in a twin pregnancy after a suicide attempt with a corrosive substance

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SUMMARY

Introduction Self-poisoning is not frequent during pregnancy. We present a successful treatment of a woman 20 weeks pregnant with twins with self-inflicted poisoning by a caustic substance.

Case outline A 34-year-old pregnant woman was admitted to our institution after self-inflicted poisoning with concentrated acetic acid. Initial clinical evaluation showed severe diffuse erythema of the mouth and oropharynx, a systemic inflammatory response syndrome, and dichorionic diamniotic twin pregnancy in the 20th week of gestation confirmed on abdominal ultrasound. An indirect laryngoscopic examination revealed severe generalized hyperemia of the laryngeal mucosa with corrosive changes in the pharyngeal mucosa, especially of the posterior pharyngeal wall. Due to pain, urgent esophagogastroduodenoscopy could not be performed, and because of the patient's refusal a feeding gastrostomy or jejunostomy could not be created. The patient was given "all-in-one" total parenteral nutrition in addition to other supportive therapy. Gradual introduction of enteral nutrition via a nasogastric tube placed in the second month of hospitalization failed due to severe vomiting. After almost three months of total parenteral nutrition, enteral nutrition was nevertheless introduced; we then started with oral fluids, increasing gradually to a regular diet, and needed almost half a month to reach the adequate nutritional goal. The delivery was spontaneous at the 36th week of pregnancy and the patient gave birth to two normal healthy girls (46 cm / 2,580 g and 48 cm / 2,960 g, respectively).

Conclusion Total parenteral nutrition can be a safe choice for providing prolonged and adequate nutritional intake even in a twin pregnancy without adverse effects on fetal growth.

Keywords: injury, caustic; pregnancy, twin; nutrition, parenteral, enteral



INTRODUCTION

Suicide attempts have increased significantly and constitute a considerable number of hospital admissions. Acute corrosive poisonings constitute 8–10% of the total number of poisonings in the United States [1, 2]. In the Republic of Serbia the incidence of poisonings with corrosive substances is less than that in the United States, and constituted 2.7% of all cases of poisoning in 2014. However, the number of hospitalized patients due to poisoning with corrosive substances is much higher and constitutes 13% of all admitted patients [3]. These suicide attempts, including self-poisoning, have produced a major socio-medical problem, mostly in young women [4, 5]. Although there are a number of studies on acute intoxication and self-poisoning, studies reporting on pregnant women are limited. Self-poisoning in suicidal attempts is not frequent during pregnancy. The majority of reports of poisoning during pregnancy are case studies and case series of self-poisoning by drug overdose, and few include acute intoxication with corrosive substances [6–13]. In addition to other therapeutic strategies in corrosive injuries, adequate nutritional support must be considered. Also, there are no clear recommendations regarding the type, amount of calories, and du-

ration of clinical nutrition in pregnant women [2]. Although many aspects of the use of total parenteral nutrition (TPN) in pregnancy are controversial, the effects of maternal malnutrition on fetal health are unambiguous [14]. With the inability to apply any kind of nutrition *per via naturalis* including oral food intake or enteral nutrition (EN), TPN must be used to avoid malnutrition, its complications and fetal compromise. We present a successful treatment of a woman 20 weeks pregnant with twins with self-inflicted poisoning by a caustic substance.

CASE REPORT

A 34-year old Caucasian pregnant woman was admitted to our institution eight hours after self-inflicted poisoning with concentrated acetic acid (CH₃COOH). On admission she had difficulty and pain on swallowing, with moderate abdominal pain. Initial clinical evaluation showed severe diffuse erythema of the mouth and oropharynx, blood pressure of 120/70 mmHg, heart rate (HR) of 100 beats per minute (bpm), without clinical signs of respiratory dysfunction and/or aspiration. Laboratory tests showed erythrocyte sedimentation rate of 54 mm/hour, red blood cell count of 3.4 million per μ L, white blood cell count of 17,000 per μ L, serum

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calcium of 7.3 mg/dL, C-reactive protein of 104 mg/L. Urine testing showed pH of 5.6, a number of fresh red blood cells and 10–15 white blood cells, large amounts of ketones, and hemoglobin. Twenty-four hours after admission the liver transaminase levels started rising and on the fourth day of hospitalization they reached maximum values of 87 IU/L for aspartate transaminase and 245 IU/L for alanine transaminase.

She had no previous psychiatric or medical history, including alcohol or illicit drug abuse, and this was her third pregnancy. Abdominal ultrasound on admission showed a dichorionic, diamniotic twin pregnancy for which the biometric parameters corresponded to the 20th week of gestation: the first fetus had HR of 144 bpm, abdominal circumference (AC) of 138/19.2, and biparietal diameter (BPD) of 50.5, and the second fetus had HR of 149 bpm, AC of 140/19.3, and BPD of 49.4 (Figure 1). An indirect laryngoscopic examination revealed severe generalized hyperemia of the laryngeal mucosa with corrosive changes in the pharyngeal mucosa especially of the posterior pharyngeal wall. Due to pain and erosion in the patient's mouth and pharynx, urgent esophagogastroduodenoscopy could not be performed. Also, a nasogastric tube could not be placed, and feeding gastrostomy or jejunostomy could not be created under local anesthesia due to patient's refusal and the potential risks of bacterial contamination.

After admission we initially started rehydration therapy with crystalloid solutions and low-dose proton pump inhibitors [15–17]. We started prophylactic antibiotic therapy with 1 million units of penicillin G sodium twice a day during the first 10 days of hospitalization. Given the inability to provide adequate nutrition via oral intake or EN, we started TPN. On admission the patient's weight and height were 72 kg and 166 cm, respectively, with a body mass index (BMI) of 26.1 kg/m². Before pregnancy, the patient's weight was 54 kg and had a BMI of 19.6 kg/m². After the placement of a central venous catheter we started TPN. The patient was given "all-in-one" TPN. The "all-in-one" solution consists of amino acids, carbohydrates, fats, electrolytes, vitamins, elements in traces, and water.

At two weeks after injury oral liquids were reintroduced, but intolerance to oral nutrition remained a reason for TPN continuation. Subclinical deficiencies of magnesium, phosphate, zinc, iron, folate, and vitamin B12 were identified and additional supplies of vitamin D and calcium were also necessary. Our main goal of treatment was to obtain optimal weight gain as for the physiologically fed pregnant woman. Fetal growth was evaluated by ultrasound.

The increase in the maternal metabolic rate was anticipated to be higher than the nutrient intake, but assumed to be compensated by the decrease in physical activity. Fat was given in the „all-in-one“ admixture, as essential fatty acids, providing 30% of total calories, and was administered over about 20 hours each day. For determining the continuing nutritional needs and for modifying the quantity of nutrients during progression of the pregnancy, we estimated albumin, transferrin, transthyretin, and daily nitrogen balance values.



Figure 1. Initial ultrasonography demonstrating 20 weeks of twin pregnancy

Three weeks after caustic injury, an esophagogastroduodenoscopy was performed. Semi-circumferential granulation at the level of the aortic arch and tracheal bifurcation, and circumferential granulation at the level of the lower esophageal sphincter were found, with normal gastric and duodenal mucosa. At the sixth week after injury, a nasoenteric tube was placed. We tried with gradual introduction of EN via nasoenteric tube, but this was unsuccessful due to severe vomiting. From the ninth to 10th week after injury the complete introduction of EN was, however, successful, after which we gradually switched the patient to normal feeding. We started with oral fluids, increasing through nutritious liquids to regular diet, and we needed almost half a month to reach adequate nutritional goals by mouth. During the conversion from TPN to EN and to oral food intake, adequate nutritional intake was provided by TPN and then partial/supplementary parenteral nutrition.

The delivery was spontaneous at the 36th week of pregnancy and the patient gave birth to two normal healthy girls (46 cm / 2,580 g and 48 cm / 2,960 g, respectively).

DISCUSSION

Acute corrosive poisonings have important complications in 18–80% of cases and a mortality rate of 10–38% [1–2]. In our country in 2014, the mortality rate of acute corrosive poisoning was 18.5% [3]. With regard to the gender of patients who died, the majority were women [1–3]. In pregnant women, with the exclusion of unplanned and unwanted pregnancy, probable reasons for suicide attempts could be explained by the many physical, psychological and physiological changes during pregnancy. In a study examining injury and hospitalization during pregnancy, poisoning was reported in 16.4% of cases [18]. The leading mechanism of suicide attempts among pregnant women in California has been ingestion of a drug overdose or corrosive substances [19]. Ingestion of caustic substances leads to systemic and sometimes fatal complications and devastating injuries of the esophagus and stomach. Treatment of these conditions

is quite complicated in itself, and therapy becomes more difficult if the problem occurs during pregnancy.

Ingestion of a caustic substance can produce various injuries to the aerodigestive tract, ranging from very mild to extensive damage, with local, systemic, and long-term complications, often with fatal outcome. In such cases, a multidisciplinary approach and timely treatment could reduce the number of complications and the mortality rate. There are several therapeutic strategies, including adequate rehydration, prevention of aspiration and acute renal injury, antibiotics, surgery if necessary, and treatment of local complications [20–22]. As for other supportive therapies in caustic injuries of the gastrointestinal tract, nutritional support is also important. Decreased maternal protein intake leads to insufficient placental perfusion and fetal compromise. Also, there are adverse effects of maternal ketosis on the fetus [23]. In any case where the patient cannot, should not, or will not eat, TPN must be considered. However, TPN must be applied with great care because of the possibility of TPN-related complications, including pneumothorax, fungemia, venous thrombosis, local infection, elevated liver enzyme levels, fatty infiltration of the placenta, etc. [23, 24].

In the past, TPN during pregnancy has been sporadically employed in the context of a lack of knowledge about maternal–fetal exchange and nutritional requirements during normal pregnancy [25]. The first case of TPN use in gestational hyperlipidemic pancreatitis was described by Weinberg et al. [26]. The patient's symptoms and triglycer-

ide levels were only controlled after initiation of lipid-free TPN; however, the fetus developed intrauterine fetal growth retardation. Adequate nutrition is vital for both mother and child. Delay in giving nutritional support or semi-starving the pregnant women may result in increased fetal mortality and morbidity. Due to our inability to place a nasogastric or nasoenteric tube in our patient we needed to provide parenteral nutritional support. In this case, prolonged parenteral feeding was needed, and a precise evaluation of nutrient needs was difficult. Our main goal of treatment was to obtain weight gain optimal for physiologically fed pregnant women (approximately 4 kg by 20 weeks and 8 kg by 30 weeks of gestation). Because of the higher metabolic rate in our patient there was an increased need of approximately 400 kcal and 40 g of protein over daily basal nutritional requirements. This regimen could logically be increased even further in a twin pregnancy [14, 25]. Our patient was delivered of two healthy neonates with no compromises in fetal growth. We attribute our success to care by experienced clinical nutrition support staff and recommend that TPN in pregnancy should always be managed by such a team.

TPN can be a safe choice for providing prolonged and adequate nutritional intake even in a twin pregnancy without adverse effects on fetal growth. In complicated cases, such as our patient, a precise evaluation of nutrient needs is difficult and adequate monitoring and therapy administration should be managed by multidisciplinary approach and experienced clinical nutrition support staff.

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Тотална парентерална исхрана у близаначкој трудноћи после покушаја самоубиства корозивним средством

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САЖЕТАК

Увод Намерно самотровање није често током трудноће.

Приказујемо успешно лечење жене у 20. недељи близаначке трудноће након покушаја самоубиства каустичним средством.

Приказ болесника Трудница у доби од 34 године примљена је након намерне ингестије концентроване сирћетне киселине. Иницијална клиничка процена указала је на изражен дифузни еритем уста и орофаринкса, синдром системског инфламаторног одговора и дихорионско диамнионску близаначку трудноћу у 20. недељи гестације утврђену ултразвучним прегледом. Ларингоскопијом је утврђена тешка генерализована хиперемична ларингеална слузница са корозивним променама на фарингеалној слузници, нарочито у пределу задњег зида фаринкса. Хитна езофагогастродуоденоскопија није урађена, а ни нутритивна гастростомија и јејуностомија због одбијања труднице.

Ординирана је тотална парентерална исхрана (ТПИ) „све у једном“ и остала супортивна терапија. Постепено увођење ентералне исхране (ЕИ) преко назоентералне сонде пласиране у другом месецу хоспитализације било је неуспешно због израженог повраћања. Након три месеца примене ТПИ, уведена је ЕИ, после чега је отпочето давање течне хране, са постепеним увођењем регуларне исхране на уста, што је трајало готово пола месеца како би се достигле адекватне нутритивне потребе. Порођај је био спонтан у 36. недељи трудноће и рођене су две нормалне здраве девојчице (46 cm / 2.580 g и 48 cm / 2.960 g).

Закључак ТПИ може бити сигуран избор у продуженом обезбеђивању адекватне количине нутритивног уноса и у близаначкој трудноћи без нежељених ефеката на фетални раст.

Кључне речи: повреда, каустична; трудноћа, близаначка; исхрана, парентерална, ентерална