

Severe amitriptyline intoxication and plasmapheresis

Tülin Çatakli, İnci Arıkan, Bülent Aliođlu, Beray Selver, Yıldız Dallar

The Ministry of Health Ankara Education and Research Hospital, Clinic of Pediatrics, Ankara, Turkey

Summary

Tricyclic antidepressant intoxication is one of the most frequently seen and life-threatening causes of intoxication among referrals to emergency departments because of drug intoxication. Especially in children, it is a major cause of mortality and morbidity. Intoxication symptoms are observed in the early phase because of a high volume of distribution and a high degree of plasma protein binding. Plasmapheresis is very effective in poisonings with amitriptyline, theophylline, diltiazem, carbamazepine, L-thyroxin, verapamil and heavy metals including mercury. American Apheresis Association Guide recommends plasmapheresis to support primary treatment in drug poisonings which do not respond to certain and traditional treatments. In this report, we wanted to emphasize that plasmapheresis treatment was successful in two subjects who presented with amitriptyline intoxication. (*Turk Arch Ped 2012; 47: 214-215*)

Key words: Amitriptyline, child, intoxication, plasmapheresis

Introduction

Amitriptyline is prescribed frequently by physicians as a tricyclic antidepressant because of its high efficiency and low cost and can be easily obtained by patients without a prescription. Tricyclic antidepressant intoxication is observed frequently in children because of accidents and in adolescents because of suicide attempt. Since the effects of amitriptyline are dose-dependent and it binds to plasma proteins with a high rate, hemodialysis and hemoperfusion are not sufficient in its excretion (1,2).

In this article, our experience about two subjects who were undergone plasmapheresis because of amitriptyline intoxication was presented.

Case 1

A 3 year-old female patient was referred to our hospital from another center with a diagnosis of drug intoxication. It was learned that the patient was brought to a hospital because of somnolence which occurred after taking amitriptyline tablets the exact number of which was not known (about 15-20 tablets, 50 mg/kg), gastric lavage was

performed and the patient was referred to our hospital since she had a seizure. On physical examination, general status was poor, consciousness was closed, the pupillae were enlarged and the light reflex was weak. Glasgow coma score was found to be 4. The patient had tachycardia (142/min) and hypotension (70/40 mmHg). No problem was found on electrocardiogram except for sinus tachycardia. Other physical examination and laboratory findings were found to be normal. Intravenous fluid, bicarbonate, activated charcoal, lidocaine and anticonvulsant treatment was started in the patient who was internalized in the Intensive Care Unit with a diagnosis of amitriptyline intoxication. Despite treatment seizures continued and the consciousness did not open. It was thought that plasmapheresis might be beneficial, since the dose taken was higher than the lethal dose. A femoral venous catheter was placed in the patient and plasma exchange was performed with fresh frozen plasma with a volume of 1,5 fold of the total amount of plasma (approximately 1000 ml) using Fresenius Com. Tec device. No complication was observed after the procedure. The patient's consciousness opened approximately 6 hours after the end of plasma exchange and clinical and laboratory findings improved after 48 hours of follow-up.

Case 2

A 9 year-old female patient was brought to the Emergency Department of the Pediatric Clinic of our hospital by her family because of loss of consciousness. In her history, it was learned that she ingested a drug which included amitriptyline as the active ingredient which her mother had been using for migraine treatment. The number of tablets taken was not known. On physical examination, the general status was poor, the consciousness was closed, the pupillae were enlarged and the light reflex was weak. Glasgow coma score was found to be 5. The patient had tachycardia (156/min). No pathology was found on electrocardiogram except for sinus tachycardia. Other physical examination and laboratory findings of the patient were found to be normal. Intravenous fluid, bicarbonate, activated charcoal and lidocaine were started in the patient who was internalized in the Intensive Care Unit with a diagnosis of amitriptyline intoxication. Despite treatment the patient's consciousness did not open. It was thought that plasmapheresis might be beneficial, since the dose taken was higher than the lethal dose. A femoral venous catheter was placed in the patient and plasma exchange was performed with fresh frozen plasma with a volume of 1-1.5 fold of the total amount of plasma (approximately 1500 ml) using Fresenius Com. Tec device. Although a marked improvement was observed in clinical findings, Glasgow coma score was still 8-9 and serum amitriptyline levels were found to be higher than the lethal level. Therefore, a second procedure of plasmapheresis was performed. No complication was observed after both procedures. The patient's consciousness opened approximately 8 hours after the end of the second plasmapheresis and clinical and laboratory findings improved after 48 hours of follow-up.

Discussion

Amitriptyline is used in conditions including depression, enuresis nocturna, attention deficit and hyperactivity syndrome and migraine in children. The fact that drug boxes can be easily opened by children in our country increases the frequency of intoxication (4,5,6,7). Amitriptyline acts by inhibiting epinephrine and serotonin reuptake from adrenergic and serotonergic neurons by membran pump inhibition. In intoxications, the central nervous system and cardiovascular system are effected most frequently (8,9). In amitriptyline intoxication, determination of the level of the drug in the blood is the most frequently used

method for diagnosis. There is no exact dose limit in childhood. The lethal dose is usually accepted to be higher than 15-30 mg/kg. Since the drug has no antidote, symptomatic treatment was administered in both of our patients. Since no adequate response was obtained, it was thought that plasmapheresis might be beneficial.

Plasmapheresis is a non-specific treatment method which is used in many immunological and toxic diseases. In patients in whom no response to certain and traditional treatments is obtained, improvement with plasmapheresis occurs (2,3,4). In native and foreign publications, it has been reported that plasmapheresis is efficient in life-threatening tricyclic antidepressant (amitriptyline) intoxications in children (2,3,4,8,9,10). The consciousness opened after plasmapheresis in our patients whose Glasgow coma scores were found to be 4 at presentation. In the 48th hour after presentation, our patients were discharged with completely improved general states and vital findings.

In this article, we wished to emphasize that it should be kept in mind that plasmapheresis treatment can be life-saving in severe amitriptyline intoxications in children.

References

1. Rodgers GC, Condurache T, Reed MD, Bestic M. Poisonings In: Behrman RE, Kliegman RM, Jenson HB, (eds). 18th ed. Nelson textbook of pediatrics. Philadelphia: Saunders 2007: 339-357.
2. Nenov VD, Marinov P, Sabeva J, Nenov DS. Current applications of plasmapheresis in clinical toxicology. Nephrol Dial Transplant 2003; 18: 56-58.
3. Yıldırım C. Acil serviste plazmaferes uygulamaları. Akademik Acil Tıp Dergisi 2007; 1: 9-12.
4. Ağın H, Çalkavur Ş, Balım H, Çelik T, Bak M. Çocuklarda trisiklik antidepressan intoksikasyonu. Çocuk Dergisi 2004; 4: 46- 50.
5. Öner N, Vatanserver Ü, Turan Ç, Okutan Ö, Şimşek A, Duran R, Karasalihoğlu S. Çocuklarda sık görülen zehirlenmelerden biri: amitriptilin zehirlenmesi. T Klin J Pediatr 2004; 13: 123-128.
6. Yılmaz HL, Özcan K, Yıldızdaş D, İncecik F, Erbey F. Günümüzde en sık karşılaşılan zehirlenme etkeni: amitriptilin. 39. Türk Pediatri kongresi, 17-22 Haziran 2003. Kongre kitapçığı, 450.
7. Daly JM, Wilens T. The use of tricyclic antidepressants in children and adolescents. Pediatr Clin North Am 1998; 45: 1123-1135 .
8. Cimili C. Sık görülen aşırı doz alımları: antidepressan ilaçlarla zehirlenmeler. T Klin Farmakoloji 2003; 1: 82-87.
9. Belen B, Akman A, Yüksel N, Dilsiz G, Yenicesu I, Olguntürk R. Case report of amitriptyline poisoning successfully treated with the application of plasma exchange. Ther Apher Dial 2009; 13: 147-149.
10. Kolsal E, Tekin IO, Piskin E, Aydemir C, Akyüz M, Cabuk H, Eldes N, Numanoglu V. Treatment of severe amitriptyline intoxication with plasmapheresis. J Clin Apher 2009; 24: 21-24.