

Hypocalcemic Syndrome in African Grey Parrot (*Psittacus erithacus erithacus*)

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Abstract

A seven-year-old male African grey parrot (*Psittacus erithacus erithacus*) was presented to the Surgery Clinic of Veterinary Faculty of the University of Sarajevo. The presenting complaint was several seizures observed two days ago. The bird was kept indoors without any other bird species, and fed whole-seed diet with no vitamin and mineral supplementation. Blood biochemistry analysis revealed hypocalcemia. The treatment consisted of oral administration of calcium and vitamins A and D. The applied therapy resulted in very fast positive response and prevented recurrence of seizures.

Keywords

African grey parrot — *Psittacus erithacus erithacus* — hypocalcemia

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Introduction

African grey parrots are predisposed to hypocalcemic syndrome. It mostly appears in young birds from two to five-year-old, but has been also described in a ten-year-old bird. It's manifested as a neurological disorder with periodical seizures during which serum calcium levels are typically less than 6.0mg/dl. Normal serum ionized calcium level in African grey parrots is 7-9.52 mg/dl (3). Calcium, as a predominant mineral in the body, constitutes 1.5% of the body weight with primarily skeletal system containment (4). Calcium and phosphorus homeostasis is a complex interaction of hormones and their metabolites, and the body organs as well. These hormones include parathyroid hormone (PTH), calcitonin and vitamin D3. Production of PTH is influenced by ionized calcium (metabolically active form - Ca⁺⁺) and cyclic 3', 5' -adenosine monophosphate (cAMP) (3). Furthermore, ionized calcium participates in coagulation, calcification of the egg shells, muscle and nerve conduction (6). As Ca⁺⁺ decreases or cAMP increases, the parathyroid gland produces more PTH. Target organs of PTH are the bones, kidneys and GI tract. Under the influence of PTH there is increased mobilization of calcium from the bone into the blood. In comparison to other mammals and birds, African grey parrots and Timneh grey parrots (*Psittacus erithacus timneh*) cannot mobilize skeletal calcium in the case of hypocalcemia (as occurs in cows with "milk fever") (3, 4). Low Ca⁺⁺ concentrations result in a decrease in electrical resistance and an increase in membrane permeability of nerve tissue, which causes hyperexcitability of the neural and muscle tissue and can result in spontaneous fiber discharge. Etiology of hypocalcemic syndrome in African grey parrots is still unconfirmed but it's including hypoparathyroidism and inadequate nutritional habits.

Material and Methods

A seven-year old male African grey parrot (*Psittacus erithacus erithacus*) was presented to the Surgery Clinic of Veterinary Faculty of the University of Sarajevo. The bird was well fleshed (440 grams) with good feather, nails and beak quality, kept indoors without any other bird species, and fed whole-seed diet with no vitamin and mineral supplementation. Detailed anamnesis was taken, and physical examination performed according to Ritchie et al. (4). Blood sample for biochemistry analysis, was taken from the cranial tibial vein with hypodermic needle (26G) in Li-Heparin LH/1.3 container. The analysis was performed on IDEXX VetTest® Chemistry Analyzer. The treatment consisted of 23 mg of calcium (SchneeKoppe, Germany) mixed with 30 ml of drinking water and two drops of water soluble vitamins A and D (Hemofarm A.D., Serbia). The client was instructed to continue with calcium and vitamin (vitamins A and D) supplementation during seven days period, and to provide quiet environment with minimal external stimuli. Recurrence preventive measures included periodical vitamin A, D3 and E supplementation, measuring of blood calcium levels, daily exposure to outdoors quality day light for several hours, and periodical feeding with yoghurt and other dairy products (1).

Results

Anamnesis revealed several neurological seizures two days ago with increasing tendency manifested as excitement, ataxia, and fainting at the end. Post-seizure period was characterized with the fast recovery to normal state (within a few minutes) and adequate appetite without regurgitation, diarrhea, coughing, or sneezing. During the physical examination the bird showed mild ataxia, and handling was not difficult as is usual with African grey parrots. Uropygial gland had normal function. All other parameters appeared normal except of irregular heartbeat. Suspected hypocal-

cemia was confirmed by detected calcium level of 4.2mg/dl.

After seven days of treatment the follow-up examination was performed. The bird behaved normally and quite difficult to restraint. Biochemistry analysis revealed calcium level of 9.12mg/dl, confirming normocalcemia. According to the client, seizures stopped after the first therapy dose.

Discussion and conclusion

Hypocalcemia-induced seizure activity is a clinical entity that is commonly diagnosed in neurologic African grey parrots (2). Contrary to our case, increased susceptibility has been reported in parrots two to five-year-old and egg-laying females (6). Etiology of hypocalcemic syndrome is still unconfirmed, where proposed mechanisms include primary hypoparathyroidism or hyperparathyroidism secondary to inadequate husbandry (3). In the presented case, secondary nutritional hyperparathyroidism is the probable cause of the syndrome, considering fed seed- based diet revealed in the anamnestic data. Furthermore, considering the same data, the bird was insufficiently exposed to the sun light. These birds are indigenous to West Africa and live in the open forest with low shade where they are exposed to high levels of UV light. In captivity, the parrots are usually kept indoors with limited access to the UV light. This might suggest that the African grey parrots require more UV light supplementation than other psittacine birds, and may explain the increased susceptibility of this breed to hypocalcemia (7). The clinical manifestation of the syndrome varies greatly depending on the individual bird and its absolute calcium status. Incoordination such as stumbling or falling off a perch, may be the first observed signs. Patients exhibiting mild neurologic abnormalities often demonstrate calcium levels within the published laboratory reference range 7-9.52 mg/dl (2, 3). The episodes gradually increase in frequency and are often exacerbated with excitement or stress. Eventually, overt seizure activity is observed, and plasma

calcium levels measured at this time are usually less than 6.0 mg/dl (5) as observed in the African grey parrot presented in this case. Other major causes of seizures in birds include epilepsy (3) and magnesium deficiency-induced progressive hypocalcemia (2). The prompt response to calcium therapy, together with no recurrence of seizures over a six month-period, rule-out both of these conditions. Prevention of hypocalcemic syndrome recurrence in African grey parrots is based on periodical evaluation of serum calcium level with consequent nutritional supplementation corrections.

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Hipokalcemični sindrom afričke sive papige- žako (*Psittacus erithacus erithacus*)

Sažetak

Uvod i ciljevi

Afričke sive papige su pasmina ptica predisponirana za nastanak sindroma hipokalcemije. Primarno se javlja kod mladih, starosti od dvije do pet godina, iako je opisana i u starijih ptica. Ispoljava se neurološkim poremećajima sa periodičnom pojavom nervnih napada, odnosno gubitkom svijesti. Sa pojavom neuroloških poremećaja vrijednosti serumskog kalcija niže su od 6.0 mg/dl, u odnosu na fiziološke vrijednosti koje se kreću između 7.0 i 9.52 mg/dl. Tačna etiologija nastanka nije definirana. Sumnja se da hipokalcemija nastaje kao posljedica primarnog hipoparatiroidizma ili sekundarnog hiperparatiroidizma usljed neadekvatne ishrane. Jednim od značajnijih predisponirajućih faktora smatra se i nedovoljno izlaganje sunčevoj svjetlosti. Prolongiranju i pogoršanju stanja hipokalcemije doprinosi i specifičnost afričkih sivih i timnejskih papiga, jer nisu sposobne mobilizirati kalcij iz kostiju, u odnosu na druge ptice i sisare. S obzirom da je u posljednje vrijeme u BiH sve veći broj afričkih sivih papiga kućnih ljubimaca, te da hipokalcemija predstavlja jedan od učestalih poremećaja istih, ovaj rad ima za cilj prikazati karakteristike kliničke dijagnostike i terapije ovog sindroma.

Materijal i metode

Na klinike Veterinarskog fakulteta Sarajevo primljen je mužjak afričke sive papige, star sedam godina, dobrog gojidbenog stanja (440 grama) i kvaliteta perja, kljuna i kandži, sa periodičnom pojavom ataksije i gubitka svijesti. Nakon detaljne anamneze i kliničkog pregleda iz kranialne tibialne vene uzorkovana je puna krv za biohemijsku analizu. Ustanovljena hipokalcemija terapijana je sa 23 mg kalcija (kalcij šumeće tablete, SchneeKoppe, Germany) u 30 ml vode za piće sa dodatkom dvije kapi vodene otopine vitamina A i D (Vitamin AD oralne kapi, Hemofarm A.D., Srbija) i korekcijom dužine izlaganja dnevnoj svjetlosti. U svrhu prevencije rekurencije hipokalcemije, klijent je upućen u neophodnost korekcije ishrane dodacima minerala i vitam-

ina, adekvatnog izlaganja dnevnoj svjetlosti i periodične provjere stanja serumskog kalcija.

Rezultati i interpretacija

Anamnestički podaci otkrili su da je prvi gubitak svijesti ustanovljen dva dana ranije od prijema pacijenta. Neurološki napadi odlikovali su se pojavom uzbuđenosti, zatim ataksijom i na kraju gubitkom svijesti u trajanju nekoliko minuta. Period nakon napada karakterizirao se brzim uspostavljanjem normalnog ponašanja sa očuvanim apetitom. Regurgitacija, dijareja, kašalj ili kihanje nisu ustanovljeni tokom ili nakon napada. Suspektna hipokalcemija potvrđena je analizom krvi, kojom je ustanovljen nizak nivo serumskog kalcija u vrijednosti od 4.2 mg/dl. Poduzeta terapija, u trajanju sedam dana, rezultirala je izostankom novih neuroloških napada i korekcijom nivoa serumskog kalcija (9.12mg/dl), odnosno normokalcemijom.

Glavni zaključci

Hipokalcemijom izazvani neurološki poremećaji predstavljaju klinički entitet učestalo dijagnosticiran u afričkih sivih papiga. Suprotno našem slučaju, najčešće se javlja kod mladih ptica, od dvije do pet godina starosti i reproduktivno aktivnih ženki. Tačna etiologija nastanka hipokalcemije još uvijek nije potvrđena. Dva predložena mehanizma podrazumijevaju primarni hipoparatiroidizam i sekundarni, neadekvatnom ishranom uzrokovan, hiperparatiroidizam. U našem slučaju, vjerovatni mehanizam nastanka je sekundarni hiperparatiroidizam, s obzirom na ustanovljenu ishranu zasnovanu na sjemenkama, bez mineralnih i vitaminskih dodataka. Klinička manifestacija sindroma znatno varira ovisno o stanju serumskog kalcija. Pojava neuroloških napada sa gubitkom svijesti opisana je kod vrijednosti serumskog kalcija nižih od 6.0 mg/dl, a što je ustanovljeno i u ovom slučaju. Diferencijalno-dijagnostički, u obzir treba uzeti epilepsiju i progresivnu hipokalcemiju izazvanu deficitom magnezija. Brz pozitivan odgovor na terapiju kalcijem i izostanak rekurencije napada tokom perioda od šest mjeseci eliminira oba navedena stanja.