Basrah Journal of Veterinary Research 2025; 24(4):43-53.

BASJVETRES

Print ISSN: 1813-8497
Online ISSN: 2410-8456
https://bjvr.uobasrah.edu.iq/

Subclinical Hypomagnesemia in Buffalo Calves in the Northern Part of Basrah-Iraq

Article Info.

Author

Jumana A. Abdulreda, Mohammed A.Y Alamery.

Department of Internal and Preventive Medicine, Veterinary Medicine College, University of Basrah, Iraq

Corresponding Author Email Address:

mohammed.yakoub@uobasrah.edu.iq

ORCID ID: https://orcid.org/0000-0003-3574-8361

Article History
Received: 19 August 2025
Accepted: 25 September 2025
e Published: 31 December 2025

Article type: **Research Article**

https://doi.org/10.23975/bjvr.2025.164196.1240

Abstract

The current study was conducted to diagnose subclinical hypomagnesemia in 75 suspected buffalo calves in the northern part of Basrah, Iraq. Twenty-five clinically healthy buffalo calves were considered controls. A blood sample was used for evaluation of the complete blood picture; moreover, extracted serum was used for biochemical assay. Results indicated a significantly lower level of magnesium in suspected buffalo calves than in controls. Nevertheless, animals show signs of pale mucous membranes, loss of appetite, stunted growth, anxiety, emaciation, tremor, and grinding teeth, with an increase in respiratory and cardiac rates, and a reduction in ruminal contraction. Blood analysis revealed a significant decrease in levels of Total erythrocyte count, Hemoglobin concentration, and Packed cell volume, as well as an increase in Mean corpuscular volume and Concentration of mean corpuscular haemoglobin in diseased buffalo calves compared with the controls, reflecting a Macrocytic Hyperchromic type of anemia. Additionally, results were also indicated as relative neutrophilia, lymphocytopenia, monocytosis, eosinopenia and basophilia. The biochemical analysis shows significant decreases in albumin, alkaline phosphatase, calcium, phosphorus, sodium, and total protein, and a significant increase in potassium in comparison with healthy control buffalo calves.

Keywords: Buffalo calves, subclinical hypomagnesemia, Basrah, Iraq.

Publisher: University of Basrah,
College of Veterinary Medicine, Basrah, Iraq

Introduction

The importance of magnesium in the body and its mechanism should be added here, has surely become a threat to Basrah buffalo producers in Iraq (1). Subclinical hypomagnesemia remains imperceptible as it does not always manifest outward symptoms, and buffalo calves can be affected without clearly being seen as diseased animals, which makes it difficult for farmers to identify and address them early enough (2). Buffalo owners must keep tabs on the signs of magnesium deficiency and account for constant monitoring of the mineral content of the animals (3). By taking proactive steps, like adjusting feed formulations or incorporating mineral supplements, they can help ensure their buffalo thrive (4). Healthy calves, after all, equate to healthier herds and higher yields in the long run (5). Buffalo calves of the northern part of Basrah province. Iraq has unique environmental and agricultural challenges, this condition imparts growth, immunity, and productivity (6,7). Besides the detection challenges that require blood testing, the asymptomatic presentation often delays diagnosis until secondary complications, which means stunted growth, higher veterinary costs, and premature culling for secondary disease appear (8,9). Therefore, the present work aimed to investigate subclinical magnesium deficiency in buffalo calves in the Northern part of Basrah, Iraq.

Materials and Methods

Animals and area of study: Seventy-five suspected buffalo calves showing signs of weakness and lethargy with pale mucous membranes were selected. Animals are of the local calves' breed, reared all day in the northern part of Basrah, Iraq. Moreover, 25 clinically healthy local calves were considered as the control group, complete clinical examinations were applied to both groups, and parasitic loads were examined according to classical methods.

Samples: Blood samples were drained from the jugular vein of each calf. 3 mL of blood mixed with EDTA is used for a complete blood picture via Dymind Biotechnology/China. Moreover, serum samples were used for biochemical analysis to evaluate magnesium, albumin, alkaline phosphatase, calcium, phosphorus, and total protein, via Spinreact/Spain analysis kits. Further, sodium and potassium were estimated using a spectrophotometer (PG-Japan).

Statistical analysis: The significance of variations between diseased calves and controls was statistically analysed using SPSS Student's t-test. The significant value was set at ($P<0.05$) (10).

Results

Results show significantly lower ($P < 0.05$) levels of magnesium in all susceptible calves compared with the controls (Table 1).

Table 1: The serum magnesium levels of susceptible buffalo calves and controls

Parameters	Control calves n=25	Diseased calves n=75	Significance
Magnesium /mmol/L	1.03±0.03	0.56±0.01*	P < 0.05

The values expressed the mean ± standard error of the mean. * (P<0.05).

Diseased buffalo calves show signs of pale mucous membrane (90.6%), loss of appetite (81.3%) stunted growth (77.3%), anxiety (58.6%), emaciation (50.6%), tremor (44%), and grinding teeth (34%) Table (2).

Table 2: Clinical findings of suspected buffalo calves with hypomagnesemia

Clinical findings	No of affected calves and (%)
Pale mucus membrane	68 (90.6%)
Loss of appetite	61 (81.3%)
Stunt growth	58 (77.3%)
Anxiety	44 (58.6%)
Emaciation	38 (50.6%)
Tremor	33 (44%)
Grinding teeth	26(34.6%)

On the other hand, diseased calves also exhibited a significant increase (P < 0.05). In respiratory rate (32.74 ± 0.54/ min) and heart rate (113.20 ± 1.01/ min), in contrast, a significant decrease (P < 0.05) in ruminal contractions (1.68 ± 0.08/ 3 min) was indicated in diseased calves than in controls. (Table 3).

Concerning the hematological analysis, diseased buffalo calves show a Macrocytic Hypochromic type of anemia due to a significant decrease (P<0.05) of TRBc, Hb, and PCV. Furthermore, the results indicated relative neutrophilia, monocytosis and basophilia as well as lymphocytopenia and eosinopenia in diseased calves compared with the controls (Table 4).

Table 3: The vital signs and ruminal contractions of buffalo calves with Hypomagnesemia and controls

Vital Signs	Control calves n = 25	diseased calves n= 75	Significance
Temperature °C	38.81 ± 0.13	39.00 ± 0.09	P > 0.05
Respiratory rate / min	29.40 ± 0.55	32.74 ± 0.54*	P < 0.05
Heart rate / min	107.04 ± 0.97	113.20 ± 1.01*	P < 0.05
Ruminal contraction /3 min	2.84± 0.13	1.68 ± 0.08*	P < 0.05

The values expressed the mean ± standard error of the mean. * (P<0.05).

Biochemical analysis of diseased buffalo calves with hypomagnesemia shows a significant lowering of value (P< 0.05) of albumin, alkaline phosphatase, calcium, phosphorus, sodium, and total protein, whereas potassium levels were increased significantly (P< 0.05), (Table 5).

Table 4: The hematological analysis of buffalo calves with hypomagnesemia and controls

Parameters	Control calves n=25	Diseased calves n=75	Significant
RBCc $\times 10^6$/L	7.95±0.08	4.44±0.21*	P<0.05
Hb (g/dl)	12.72±0.27	9.54±0.09*	P<0.05
PCV %	33.88±0.55	26.69±0.35*	P<0.05
MCV (fl)	47.88±0.67	50.29±0.47*	P<0.05
MCHC (g/dl)	33.14±0.14	35.60±0.37*	P<0.05
Total leukocytes$\times 10^3$	8.79±0.22	8.70±0.12	P>0.05
Neutrophils (%)	31.41±0.65	36.66±0.39*	P<0.05
Lymphocytes (%)	61.89±0.85	53.79±0.40*	P<0.05
Monocytes (%)	3.76±0.13	4.01±0.09*	P<0.05
Eosinophils (%)	4.17±0.18	2.98±0.11*	P<0.05
Basophils (%)	0.84±0.04	1.95 ±0.12*	P<0.05

The values expressed the mean ± standard error of the mean. * (P<0.05).

Table 5: Biochemical analysis of diseased calves with hypomagnesemia and controls.

Parameters	Unit	Control calves Mean ±SE	Affected calves Mean ±SE	Significant
Albumin	g/L	32.4±1.30	26.34±0.72*	P< 0.05
Alkaline phosphatase	u/L	175.2±8.32	116.37±3.17*	P< 0.05
Calcium	mmol/L	4.08 ± 0.15	2.44±0.07*	P< 0.05
Phosphorus	mmol/L	2.42± 0.12	1.74±0.05*	P< 0.05
Potassium	mmol/L	4.56± 0.10	5.27±0.07*	P< 0.05
Sodium	mmol/L	139.2± 2.33	124.48±1.89*	P< 0.05
Total protein	mmol/L	71.4 ± 2.83	61.85±1.59*	P< 0.05

The values expressed the mean ± standard error of the mean. * (P<0.05).

Discussion

Subclinical hypomagnesemia is likely underestimated and of concern based on findings from comparable ecosystems north of Basrah; hence, region-specific research has focused on estimating prevalence and optimizing interventions. The buffalo calves are linked with traditional grazing systems with low-quality forage (11).

The present work on buffalo calves' magnesium deficiency indicated low levels of magnesium in diseased animals. These low levels of magnesium in diseased animals in buffalo calves is an alarming finding indicative of hypomagnesemia (2). It is a serious threat to their health and deserves immediate veterinary attention and corrective management to prevent potentially fatal effects like tetany and correct underlying nutritional deficiencies (12). The subclinical magnesium was assessed previously with results ranging between 0.34-0.7 mmol/L (7,13). The northern part of Basrah province's traditional grazing systems can subject calves to poor pasture quality, in line with global pasture quality problems in terms of nutrition (11). Stressful events or sudden feed changes trigger such calves into magnesium deficiency (14,15).

The signs of anorexia, stunted growth, anxiety, tremor, and bruxism were also recognized by others (16). Anxiety and tremor are early classic manifestations of hypomagnesemia due to hyperexcitability of neurons (5). Fine muscle tremors are a direct consequence of neuromuscular dysfunction and unstable nerve cell membranes due to decreased Mg^{2+}. This is a precursor of more severe tetany (17).

Besides, grinding of teeth is a characteristic sign of pain, discomfort, and neuromuscular upset in cattle, commonly observed in hypomagnesemia and hypocalcemia (18). Magnesium also upsets appetite, as it is critical for enzyme activity and energy metabolism. The deficiency immediately suppresses the function of the rumen and appetite (19). Further, stunt growth consequence results directly from anorexia and disturbed growth-relevant metabolic processes (protein synthesis, energy metabolism), and then emaciation is the terminal effect of persistent anorexia and poor nutrient utilization/metabolism (7). Buffalo calves raised indoors or under intensive systems have the potential to be fed with unbalanced diets that are deficient in magnesium, iron, and copper. This is brought out by studies that associated poor growth with poor mineral supplementation and indoor management, which is also related to anemia and pale mucous membrane appearance (20). Severe anemia arising here will also reflect metabolic acidosis and anaerobic respiration (21).

Vitally, the increased heartbeat is related to decreased magnesium level, as magnesium is needed for the normal repolarization of cardiac muscle cells and electrolyte balance. Deficiency may lead to cardiac irritability and arrhythmias. It also leads to catecholamine release (2, 22). Essentially, crucial high respiration and tachypnea occur following hypomagnesemia, which could be related to decreased oxygen level due to anaemic crisis (7). Magnesium is a calcium antagonist that causes relaxation of bronchial smooth muscles, while deficiency leads to unopposed entry of calcium with consequent narrowing of the airways, increasing airway resistance (21). Hypomagnesemia in itself is not typically pyrogenic. The absence of fever helps to rule out primary infectious causes. As in cases of pneumonia and septicaemia as the immediate explanation of the respiratory and cardiac syndrome (5). Magnesium is essential to rumen wall nerve transmission and smooth muscle contraction. Deficiency paralyzes the motility of the rumen. Anorexia and emaciation further exacerbate this (2, 23). Further ruminal stasis creates egregious gastrointestinal dysfunction, perpetuating the metabolic crisis by preventing intake and absorption of any nutrients or supplements (24). The tachypnea, tachycardia and stasis of the rumen guarantee the hypomagnesemia in such calves has progressed to a life-threatening systemic crisis affecting the nervous, cardiovascular, muscular, and gastrointestinal systems (22,23).

Following hypomagnesemia, there was a reduction in erythrocytes and their hemoglobin content and packed cell volume, concurrently presenting anemia in infected buffalo calves in this study. Anemia was clearly observed in the diseased buffalo calves. The reason for this may be attributed to the lack of production of red blood cells and haemoglobin due to the impact on the absorption of their basic resources, such as iron and proteins. In addition, the deficiency may also lead to the lack of vitality of these cells, especially for transporting oxygen (25).

Magnesium deficiency was not a cause of change in total leucocytes, which is classified as a noninfectious disease (5). However, the relative distribution of different white blood cells has changed dramatically. Such an increment of neutrophils and monocytes in response to stress following hypomagnesemia (26). While lymphocytes and eosinophils relatively decrease are classically associated with Stress Leukogram: Glucocorticoids (cortisol) cause lymphocytes to leave the circulation and sequester in lymphoid organs (27). Further, Hypomagnesemia triggers increased production of a number of inflammatory cytokines, including interleukin (IL)-1, IL-6, and tumor necrosis factor (TNF)-α, that can stimulate basophil differentiation and survival (28).

The biochemical profile is that of an extreme metabolic crisis necessitating intensive intervention. Hypomagnesemia in these buffalo calves has set up a cascade of considerable importance, that subclinical hypocalcemia, which is associated with protein loss or allied malnutrition as consequent of lowered albumin and total protein (29), what's more lowered metabolic activity which associated with decreased alkaline phosphatase (30), and there was sodium loss, the hyponatremia in hypomagnesemia is due to renal sodium wasting or parathyroid hormonal disturbances (31). That effect can be managed while giving magnesium parenterally or orally and correcting the underlying cause so as to correct sodium balance (7). Hypomagnesemia may lead to uncontrolled potassium secretion through its channels in the short term. Although chronic deficiency of magnesium can lead to downregulation of the channels or altered regulation, ultimately decreased renal potential for potassium excretion, and the development of increased potassium levels in buffalo serum (2, 32, 33).

Hypomagnesemia can cause refractory hypocalcemia because magnesium is required for parathyroid hormone release and action (30,32). Magnesium and phosphorus metabolism are closely linked by renal excretion mechanisms, hormonal regulation, and shared transport processes in the kidney. The deficiency of magnesium disrupts phosphorus homeostasis via parathyroid hormone dysfunction (34,35). The biochemical profile of hypomagnesemic buffalo calves indicates a complex metabolic derangement involving protein, minerals, and electrolyte imbalance.

Conclusion

This study showed that subclinical magnesium deficiency has great clinical significance when it occurs in farm animals, as it causes the animal to be stressed, lose its overall weight, and develop anaemia, which may predispose the affected animal to secondary infectious diseases that may lead to its death. Therefore, early diagnosis of diseased animals, along with the selection of good grazing areas and providing animals with balanced feed, are indicators of control and elimination of this clinical problem.

Acknowledgments

The authors would like to sincere gratitude to the Veterinary Ambulance Boat Team of the Iraqi Green Climate Organization for facilitating sample collection for the study via the boat, which greatly contributed to the successful completion of this research.

Conflict of interest

There is no conflict of interest regarding the publishing of this article.

Ethical Approval

The Research Ethics Committee approved this work.

References

1. Abbas, M. F., & Fahad, T. A. (2016). Effect of deficiency some minerals (calcium nonorganic phosphorus and magnesium) on occurrence of uterine prolapse in local buffalo's breed in Basra province. *Basrah Journal of Veterinary Research*,*15*(3), 27-33. https://doi.org/10.23975/bjvetr.2016.170650
2. Doncel, B., Capelesso, A., Giannitti, F., Cajarville, C., Macías-Rioseco, M., Silveira, C., Costa, R. A., & Riet-Correa, F. (2019). Hypomagnesemia in dairy cattle in Uruguay. *Pesquisa Veterinária Brasileira, 39*(08), 564–572. https://doi.org/10.1590/1678-5150-pvb-6215
3. Chiariotti, A., Borghese, A., Boselli, C., & Barile, V. L. (2025). Water Buffalo's Adaptability to Different Environments and Farming Systems: A Review. *Animals: an open access journal from MDPI, 15*(11), 1538. https://doi.org/10.3390/ani15111538
4. Mohd Azmi, A. F., Ahmad, H., Mohd Nor, N., Goh, Y. M., Zamri-Saad, M., Abu Bakar, M. Z., Salleh, A., Abdullah, P., Jayanegara, A., & Abu Hassim, H. (2021). The Impact of Feed Supplementations on Asian Buffaloes: A Review. *Animals : an open access journal from MDPI*, *11*(7), 2033. https://doi.org/10.3390/ani11072033
5. Smith, B. P. (2014). Large Animal Internal Medicine-E-Book: Large Animal Internal Medicine-E-Book. *Elsevier Health Sciences*.
6. Alsaad, K. A. (2021). Clinico-hematobiochemical and Pathological Study of Acute Nutritional Muscular Dystrophy of Adult Buffalo Calves at Basrah, Iraq. *Egyptian Journal of Veterinary Sciences, 52*(3), 283-291. https://doi.org/10.21608/EJVS.2021.67877.1224
7. Constable, P. D., Hinchcliff, K. W., Done, S. H., & Grünberg, W. (2016). Veterinary medicine: a textbook of the diseases of cattle, horses, sheep, pigs and goats. *Elsevier Health Sciences.*

8. Zelal, A. (2017). Hypomagnesemia tetany in cattle. *Advances in Dairy Research, 5*(2), 1–9. https://doi.org/10.4172/2329-888X.1000178
9. Neves, R. C., Leno, B. M., Stokol, T., Overton, T. R., & McArt, J. A. A. (2017). Risk factors associated with postpartum subclinical hypocalcemia in dairy cows. *Journal of Dairy Science, 100*(5), 3796–3804. https://doi.org/10.3168/jds.2016-11970
10. Leech, NL., Barrett, KC and Morgan, GA. (2007). SPSS for intermediate statistics: use and interpretation 1st Ed. *Lawrence Erlbaum Assoc. USA.* 20-51. https://doi.org/10.4324/9781410610539
11. da Silva, J. A. R., Garcia, A. R., de Almeida, A. M., Bezerra, A. S., & de Brito Lourenço Junior, J. (2021). Water buffalo production in the Brazilian Amazon Basin: A review. *Tropical Animal Health and Production, 53*(3), 343. https://doi.org/10.1007/s11250-021-02744-w
12. Martín-Tereso, J., & Martens, H. (2014). Calcium and magnesium physiology and nutrition in relation to the prevention of milk fever and tetany (dietary management of macrominerals in preventing disease). *Veterinary Clinics: Food Animal Practice, 30*(3), 643-670. https://doi.org/10.1016/j.cvfa.2014.07.007
13. Melendez, P., Lopez, F., Lama, J., Leon, B., & Pinedo, P. (2022). Plasma ionized calcium and magnesium concentrations and prevalence of subclinical hypocalcemia and hypomagnesemia in postpartum grazing Holstein cows from southern Chile. *Veterinary and animal science, 19*, 100277. https://doi.org/10.1016/j.vas.2022.100277
14. Seelig, M. S. (1994). Consequences of magnesium deficiency on the enhancement of stress reactions; preventive and therapeutic implications (a review). *Journal of the American College of Nutrition, 13*(5), 429-446. https://doi.org/10.1080/07315724.1994.10718432
15. Matsui, T. (2007). Significance of magnesium in animals. In New Perspectives in Magnesium Research: Nutrition and Health (pp. 381-391). *London: Springer London*
16. Foster, A., Livesey, C., & Edwards, G. (2007). Magnesium disorders in ruminants. *In Practice, 29*(9), 534-539. https://doi.org/10.1136/inpract.29.9.534
17. Tosto, F., Magro, G., Laterza, V., & Romozzi, M. (2025). Neurological manifestations of hypermagnesemia: A narrative review. *Acta Neurologica Belgica, 125*(2), 283-298. https://doi.org/10.1007/s13760-024-02653-3
18. Goff, J. P. (2014). Calcium and magnesium disorders. *Veterinary Clinics: Food Animal Practice, 30*(2), 359-381. https://doi.org/10.1016/j.cvfa.2014.04.003
19. Fontenot, J. P., Allen, V. G., Bunce, G. E., & Goff, J. P. (1989). Factors influencing magnesium absorption and metabolism in ruminants. *Journal of Animal Science, 67*(12), 3445-3455. https://doi.org/10.2527/jas1989.67123445x
20. Ali, M. A., El-Khodery, S. A., & El-Said, W. E. (2015). Potential risk factors associated with ill-thrift in buffalo calves (Bubalus bubalis) raised at smallholder farms in Egypt. *Journal of Advanced Research, 6*(4), 601-607. https://doi.org/10.1016/j.jare.2014.02.005

21. Hindman, M. S. (2023). Metabolic diseases in beef cattle. *Veterinary Clinics: Food Animal Practice*, *39*(2), 337-353. https://doi.org/10.1016/j.cvfa.2023.02.011

22. Korpela, H. (1991). Hypothesis: increased calcium and decreased magnesium in heart muscle and liver of pigs dying suddenly of microangiopathy (mulberry heart disease): an animal model for the study of oxidative damage. *Journal of the American College of Nutrition*, *10*(2), 127-131. https://doi.org/10.1080/07315724.1991.10718136

23. Lobo, R. R., Arce-Cordero, J. A., So, S., Soltis, M., Marinho, M. N., Agustinho, B. C., ... & Faciola, A. P. (2023). Production, physiological response, and calcium and magnesium balance of lactating Holstein cows fed different sources of supplemental magnesium with or without ruminal buffer. *Journal of Dairy Science*, *106*(2), 990-1001. Doi: 10.3168/jds.2022-22583

24. Piantoni, P., & VandeHaar, M. J. (2023). Symposium review: The impact of absorbed nutrients on energy partitioning throughout lactation. *Journal of Dairy Science*, *106*(3), 2167-2180. Doi: 10.3168/jds.2022-22500 External Link

25. Abramowicz, B., Lutnicki, K., & Kurek, L. (2021). The influence of clinical and chronic forms of magnesium deficiency on the haematological parameters of dairy cows. *vet. archiv*. *91*(2), 117-124. https://doi.org/10.24099/VET.ARHIV.1011

26. Jiménez-Penago, G., Hernández-Mendo, O., González-Garduño, R., Torres-Hernández, G., Torres-Chablé, O. M., & Maldonado-Simán, E. (2021). Mean corpuscular hemoglobin concentration as hematological marker to detect changes in red blood cells in sheep infected with Haemonchus contortus. *Veterinary Research Communications*, *45*(4), 189-197. https://doi.org/10.1007/s11259-021-09800-8

27. Gupta, S., Sharma, A., Joy, A., Dunshea, F. R., & Chauhan, S. S. (2022). The impact of heat stress on immune status of dairy cattle and strategies to ameliorate the negative effects. *Animals*, *13*(1), 107. **https://doi.org/10.3390/ani13010107**

28. Saglietti, F., Girombelli, A., Marelli, S., Vetrone, F., Balzanelli, M. G., & Tabaee Damavandi, P. (2023). Role of magnesium in the intensive care unit and immunomodulation: a literature review. *Vaccines*, *11*(6), 1122. **https://doi.org/10.3390/vaccines11061122**

29. Doncel, B., Puentes, J. D., Caffarena, R. D., Riet-Correa, F., Costa, R. A., & Giannitti, F. (2021). Hypomagnesemia in beef cattle. *Pesquisa Veterinária Brasileira*, *41*, e06826. https://doi.org/10.1590/1678-5150-PVB-6826

30. Hernández-Gotelli, C., Wittwer, F., Wagemann-Fluxá, C., & Sepúlveda-Varas, P. (2024). Association between prepartum subclinical magnesium imbalance and postpartum diseases in grazing dairy cows in Southern Chile. *Tropical Animal Health and Production*, *56*(6), 206. https://doi.org/10.1007/s11250-024-04044-5

31. Ashique, S., Kumar, S., Hussain, A., Mishra, N., Garg, A., Gowda, B. J., ... & Taghizadeh-Hesary, F. (2023). A narrative review on the role of magnesium in immune regulation, inflammation, infectious diseases, and cancer. *Journal of Health, Population and Nutrition*, *42*(1), 74.https://doi.org/10.1186/s41043-023-00461-8

32. Hassan, N. F., Mohamed, M. M. A., Ali, A. S. O., & Mohamed, A. E. S. A. (2023). Diagnosis of Hypomagnesaemia in Heifer calves and Experimental Treatment with Magnesium Oxide and Basil &Thyme. *SVU-International Journal of Veterinary Sciences*, *6*(4), 73-92. https://doi.org/10.21608/svu.2023.228161.1290

33. Self, D., Spontarelli, K., Colmano, N. G., Seflova, J., & Artigas, P. (2025). BPS2025-Pathophysiological mechanisms of hypomagnesemia with seizures and cognitive delay caused by Na, K-ATPase mutations. *Biophysical Journal*, *124*(3), 231a-232a.

34. Jain, P. K., Jain, A., & Jain, A. (2025). Calcium, Phosphorus, and Magnesium Abnormalities in the ICU. In ICU Protocols: A Step-wise Approach, Vol II (pp. 43-54). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-96-5636-3_4

35. Vetter, T., & Lohse, M. J. (2002). Magnesium and the parathyroid. *Current opinion in nephrology and hypertension*, *11*(4), 403-410. 10.1097/00041552-200207000-00006

نقص المغنيسيوم دون السريري في عجول جاموس شمال البصرة , العراق

جمانة عبد الرضا عبد الحسن، محمد عبد الحسين يعقوب العامري

فرع الطب الباطني والوقائي، كلية الطب البيطري، جامعة البصرة .

الخلاصة

أجريت الدراسة الحالية لتشخيص نقص المغنيسيوم دون السريري في 75 عجل جاموس مشتبه به في الجزء الشمالي من محافظة البصرة، العراق. كما تم فحص 25 عجل جاموس سوياً سريرياً عدو كمجموعة سيطرة. تم اجراء فحوصات الدم لتقييم صورة الدم الكاملة، فضلا عن استخدام المصل المستخرج لتقييم بعض الفحوصات الكيموحيوية. أشارت النتائج إلى انخفاض مستوى المغنيسيوم بشكل ملحوظ في عجول الجاموس المشتبه بها بالمقارنة مع مجموعة السيطرة ولوحظ على العجول علامات سريرية تمثلت بشحوب الغشاء المخاطي، وفقدان الشهية، وتأخر النمو، والهزال، والارتعاش، وصرير الأسنان، وزيادة في معدل التنفس و ضربات القلب، وانخفاض في تقلصات الكرش. وأظهر فحص الدم انخفاضًا ملحوظًا في معدل كريات الدم الحمراء وتركيز خضاب الدم وحجم خلايا الدم المرصوصة، فضلا عن زيادة في متوسط حجم الكريات وتركيز خضاب الدم مما انتج فقر دم من النوع ذي الكريات كبيرة الحجم قليلة الصباغ . كما لوحظت زيادة في العدلات ووحيدة النواة، وانخفاض في عدد الخلايا الليمفاوية والحمضات، واظهرت نتائج التحليل الكيموحيوي انخفاضًا ملحوظًا في معدلات الألبومين والفوسفاتيزالقاعدي والكالسيوم والفوسفور والصوديوم والبروتين الكلي، وزيادة ملحوظة في البوتاسيوم مقارنةً بعجول مجموعة السيطرة. تم اجراء فحوصات الدم لتقييم صورة الدم الكاملة، فضلا عن استخدام المصل المستخرج لتقييم بعض الفحوصات الكيموحيوية. أشارت النتائج إلى انخفاض مستوى المغنيسيوم بشكل ملحوظ في عجول الجاموس المشتبه بها بالمقارنة مع مجموعة السيطرة ولوحظ على العجول علامات سريرية تمثلت بشحوب الاغشية المخاطية ، وفقدان الشهية، وتأخر النمو، والهزال، والارتعاش، وصرير الأسنان، وزيادة في معدل التنفس و تسارع ضربات القلب، وانخفاض في تقلصات الكرش. وأظهر فحص الدم انخفاضًا ملحوظًا في معدل كريات الدم الحمراء وتركيز خضاب الدم وحجم خلايا الدم المرصوصة, فضلا عن زيادة في متوسط حجم الكريات وتركيز خضاب الدم مما انتج عنة فقر دم من النوع ذي الكريات كبيرة الحجم قليلة الصباغ. كما لوحظت زيادة العدلات ووحيدة النواة , وانخفاض في عدد الخلايا الليمفاوية والحمضات. وتضمن التحليل الكيموحيوي نخفاضًا ملحوظًا في مستويات الألبومين والفوسفاتيز القاعدي والكالسيوم والفوسفور والصوديوم والبروتين الكلي، وزيادة ملحوظة في البوتاسيوم بالمقارنة بمجموعة السيطرة .

الكلمات المفتاحية؛ عجول الجاموس، دون السريري، المغنيسيوم، البصرة.