

**BIOCHEMICAL STUDIES DURING DIFFERENT PATHOLOGICAL CONDITIONS IN KIDNEYS OF BUFFALOES**

Shailendra Singh, U.K.Garg and Supriya Shukla

Department of Veterinary Pathology,

College of Veterinary Science &amp; Animal Husbandry, Rewa-486 001

Nanaji Deshmukh Pashu Chikitsa Vigyan Vishwavidyalaya,

Jabalpur-482001, M.P., India

Corresponding author : drshailendravet@gmail.com

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**ABSTRACT**

The present investigation was carried out to study the spontaneous occurrence of various pathological conditions and their pathomorphological alterations in the kidneys of buffaloes, with possible correlation to biochemical parameters. Blood urea nitrogen was significantly higher in all pathological conditions of kidneys. Serum total proteins were higher in case of renal infarction, fatty degeneration, pyelonephritis, polycystic kidney, calcification, embolic nephritis and pigmentation. Total protein was found to be lower in case of amyloidosis, interstitial nephritis, hydronephrosis, and nephrolithiasis.

**KEY WORDS:** Biochemical, Serum total protein, Blood Urea Nitrogen, Serum glucose, kidney

**INTRODUCTION**

Buffaloes stand very prone to various bacterial, viral, fungal and parasitic diseases, in addition to other diseases of diverse etiology. Most of the pathogens and toxins that gain entrance into blood circulation cause damage specifically to the kidney. The reason being 1/5th of the total blood volume circulates through the kidneys every minute, thus exposing the same to the circulating pathogenic agents of all types. In the present study attempt has been made to evaluate biochemical changes in different patholaogical conditions in kidneys of buffaloes.

**MATERIALS AND METHODS**

The materials for the present study comprised of kidney and blood samples obtained from buffaloes slaughtered at the Cantonment Board Slaughter House, Mhow, (M.P.) Which were brought from the different parts of Malwa region as a source of meat. A total number of 500 buffaloes ranging from 4 to 12 years of age were examined for kidney lesions. To determine the biochemical changes, 5ml of blood sample was collected during slaughter of buffalo in a sterile centrifuge tube. The serum was separated by centrifugation at 2000 rpm for ten minutes. Serum Total Protein was estimated by Biurate Method as described by Tietz (1986) and values are expressed in gm/dl. Blood Urea Nitrogen was estimated by DAM method using Acesure BUN reagent kit as described by Marsh et al. (1965) and values are expressed in mg/dl. Serum Glucose was estimated by GOD method using Mercko test based on GOD kit as described by Mayne (1994) and values are expressed in mg/dl.

**RESULTS AND DISCUSSION**

Total protein, blood urea nitrogen and serum glucose were estimated in the blood of buffaloes harbouring the renal pathological conditions are presented in Table 1 and were compared with the normal range recorded by Brar et al.(2000). From the table 1 it is evident that the value of blood glucose varied within the normal range irrespective of the pathological condition encountered except

**Table 1:** The mean values of biochemical parameters in buffaloes during different pathological conditions in kidney (Mean + SE).

Pathological conditions	No. of cases	Serum total Protein (gm/dl)	Blood urea nitrogen (mg/dl)	Serum glucose (mg/dl)
Hypertrophy and Hypoplasia	2	7.24±0.70	36.67±0.31	36.11±0.35
Polycystic kidney	2	5.58±2.80	34.08±1.7	37.15±1.8
Fatty degeneration	2	8.67±0.31	35.08±0.11	46.17±0.67
Amyloidosis	2	5.67±0.31	37.66±0.30	37.46±0.55
Vascular abnormalities	5	5.14±0.20	36.18±0.55	40.38±0.58
Renal infarction	1	8.23±0.0	37.01±0.0	35.67±0.0
Interstitial nephritis	3	5.75±0.32	36.39±0.56	54.79±1.18
Glomerulonephritis	3	5.86±0.19	36.39±0.22	27.54±0.62
Pyelonephritis	4	9.42±0.32	37.65±0.39	42.41±0.76
Embolic nephritis	1	8.21±0.0	37.8±0.0	41.2±0.0
Hydronephrosis	6	5.7±0.16	36.16±0.32	27.49±0.38
Nephrolithiasis	8	5.74±0.17	37.24±0.26	39.28±0.50
Calcification	2	7.8±0.04	31.22±0.20	38.76±0.74
Pigmentation	1	8.92±0.0	32.23±0.0	40.63±0.0
** Normal values for buffaloes	-	6.8-7.7	10-30	32-60

\*\*Brar et al. (2000).

hydronephrosis and glomerulonephritis. However, the values for blood urea nitrogen fluctuated above the highest range value in all pathological conditions (Table1). The highest value of serum total protein (9.42±0.32) was recorded in pyelonephritis but the lowest value (5.14±0.20 gm/dl) was exhibited in vascular abnormalities as compared to normal values. In the present study, the total protein values were higher in case of renal infarction, fatty degeneration, pyelonephritis, embolic nephritis, calcification and pigmentation. The raised protein could be ascribed to developing

anaemia with the release of protein constituents out of erythrocytic membrane contributing to increase in its contents. Total protein was found to be lower in case of amyloidosis, vascular abnormalities, interstitial nephritis, hydronephrosis, polycystic kidney and nephrolithiasis. This may be due to protein excretion through urine, because of abnormalities in Bowman's capsule of kidney. In case of hypertrophy and hypoplasia the total protein was found to be normal when compared with normal range given by Brar et al. (2000).

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