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Research Article

Response of mineral mixture, prajana and GnRH on serum biochemical constituents and conception rate in anoestrus buffalo

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ABSTRACT

The serum biochemical constituents (calcium, inorganic phosphorus, total serum protein, blood glucose and alkaline phosphatase) concentration in cycling buffaloes were significantly ($P < 0.05$) higher than non cycling buffalo. Out of 30 anoestrus buffalo cows treated with supplevite –M ,14 (16.66%) showed estrus after 30 days treatment,10 buffalo (71.42%) conceived. Out of 32 buffalo heifers 24 were anoestrus and the 8 were under normal cyclic. The anoestrus animals were treated with supplevite-M, at the rate of 25 gm/day per animal twice daily for 30 days. The blood biochemical profile of normal cycling as well as treated animal was done on 0, 15, and 30th day. No significant difference was noted in serum biochemical constituents in cycling animal while in treated anoestrus animal all the parameters studied and found to be significant.

Key words: Anestrus, serum biochemical, GnRH, Prajana, mineral mixture

It was found that out of 24 anoestrus animal treated 11 (45.83%) came into estrus and 7 (63.63%) conceived. Among the remaining 16 anoestrus buffaloes 8 were treated with Prajana capsule and another eight with GnRH .The Prajana and GnRH treated groups exhibited 75% and 87.50% estrus, respectively. The conception rate in treated groups were 66.66% and 71.42%, respectively. The serum calcium inorganic phosphorus, total protein, blood glucose and alkaline phosphatase concentration were similar in mineral, GnRH and Prajana treated group. However, values of treated group at estrus were significantly higher than pretreatment value of an estrus buffalo. Observations reveal that mineral mixture enhance the biochemical profile of anoestrus buffalo cows to the level of cycling buffalo and interpret the mechanism responsible for resumption of estrus cyclicity in anoestrus buffaloes. Minerals like calcium and phosphorus and hormones play vital role in regulation of hormones and enzymes for initiation of anoestrus (Morrow, 1977).

MATERIALS AND METHODS

The experiment was conducted on 70 non-descript buffalo having 38 buffalo cows and 32 buffalo heifers (3.5 to 4.5 yr age) from outdoor clinics and from different organized Khatals located around Patna. Out of 38 buffalo cows 30 were in anoestrus and out of 32 buffalo heifers, 24 were in anoestrus conditions. Reproductive genitalia of anoestrus animals were examined through rectal palpation. The animals of smooth ovaries were selected for the studies whereas the buffalo cows that did not exhibit sign of estrus for a period of more than 180 days after parturition were selected. All the animals were dewormed before initiation of treatment.Thereafter anoestrus animals were treated with minerals supplement (Supplevite-M) on the dose rate of 25gm/day per animal twice daily for 30 days. The second group of buffalo cows was treated with single dose receptal (GnRH) at dose rate of 5ml im. The third group of buffalo cows was treated with Prajana with the dose rate of 2 caps twice daily for 3 days. All the animals were kept under close observation for the detection of heat. The animal in heat was inseminated with frozen semen at the interval of 12 hr. Blood sample were collected aseptically from jugular vein on 0,15th and 30th day after treatment. Serum was separated and constituents like glucose, protein, calcium, inorganic phosphorus and alkaline phosphatase were estimated and

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Table 1: Response of mineral mixture, Prajana and GnRH treated on blood biochemical constituents of cycling and non-cycling buffalo heifers and buffalo cows.

	Reproductive status	No. of animals	Serum Calcium mg/100 ml	Inorganic phosphorus mg/100 ml	Total protein gm/100 ml	Blood glucose mg/100 ml	Alkaline phosphatase KAU/100 ml
BUFFALO HEIFER	Oestrus (N.C.) Control	8	10910a ± 0.078 (20273)	6.142a ± 0.144 (7.408)	7.887ac ±0.068 (2.726)	61.058a±0.495 (2.566)	11.318acd ±0.408 (11.397)
	Pretreated Anoestrus	24	9.907b ±0.170 (8.427)	4.295b ± 0.169 (19.278)	5.810b ± 0.15 (12.39)	45.408b±0.014 (10.941)	6.724b±0.483 (35.187)
	Induced oestrus with minerals	11	10.993a±0.286 (8.65)	6.023a±0.132 (7.289)	8.130a ±0.166 (6.765)	60.774a±1.783 (9.734)	10.109acd ±0.366 (10.017)
	Induced oestrus with GnRH	5	11.492a±0.294 (5.334)	6.048a ± 0.214 (7.919)	8.1ad ± 0.241 (6.619)	62.048a ± 1.006 (3.626)	12.30acd±0.564 (10.206
	Induced oestrus with Prajana Cap.	6	10.998a±0.349 (7.101)	6.020a ±0.185 (7.552)	8.133ae ±0.171 (4.697)	61.082a±1.568 (5.739)	12.325acd±0.949 (17.217)
BUFFALO COW	Oestrus (N.C.) Control	8	11.148a±0.107 (3.032)	6.247a±0.132 (6.691)	7.794af±0.039 (1.617)	60.88a±1.166 (6.122)	10.692ad±0.393 (11.635)
	Pretreated Anoestrus	30	9.106c±0.201 (12.113)	4.354b±0.117 (14.676)	5.880b±0.170 (15.86)	46.819b±1.419 (16.596)	6.395b±0.429 (36.732)
	Induced oestrus with minerals	14	11.099a±0.272 (9.91)	6.235a±0.130 (7.827)	7.713ag±0.1 (7.875)	62.355a±1.318 (7.911)	12.421ac±0.354 (10.667)
	Induced oestrus with GnRH	7	11.14a±0.343 (8.15)	6.235a±0.137 (5.838)	7.953ah±0.143 (4.765)	63.198a±1.421 (5.949)	10.727d±0.628 (15.493)
	Induced estrus with Prajana Cap.	6	11.61a±0.328 (6.925)	6.227a±0.253 (9.956)	7.437cdefgh±0.149 (4.908)	60.982a±1.424 (5.718)	12.618ce±0.981 (19.044)

Means with the different superscripts taken column-wise separately differ significantly ($P<0.05$).

Table 2: Response of mineral mixture, Prajana and GnRH treatment on blood biochemical constituents of normal and anoestrus buffalo heifers.

	Status of Animals	Days	No. of animals	Serum Calcium mg/100 ml	Inorganic phosphorus mg/100 ml	Total protein gm/100 ml	Blood glucose mg/100 ml	Alkaline phosphatase KAU/100 ml
NORMAL CYCLING		0	8	10.101^{ae}±0.245 (6.87)	6.346^{af}±0.232 (10.337)	7.675^{ac}±0.066 (2.423)	49.942 ± 0.829 (4.693)	8.161^{a}±0.466 (16.141)
	Buffalo Heifers	15^{th}	8	11.132^{ae}±0.251 (6.998)	6.407^{af}±0.310 (13.719)	7.762^{ac}±0.088 (3.208)	49.234^{aef}±0.654 (7.946)	8.235^{a}±0.483 (16.599)
		30^{th}	5	9.766^{ace}±0.189 (4.342)	6.432^{af}± 0.118 (12.205)	7.912^{a}±0.118 (3.362)	49.184^{acef}±0.826 (3.763)	8.710^{a}±0.534 (13.708)
ANOESTRUS		0	24	9.908^{ade}±0.170 (8.427)	4.295^{b}±0.169 (19.278)	5.810^{b}±0.150 (12.390)	45.408^{bcd}±1.014 (10.941)	6.724^{a}±0.483 (35.187)
	Buffalo Heifers	15^{th}	20	9.980^{ae}±0.186 (8.336)	5.609^{cd}±0.134 (10.715)	6.949^{d}±0.117 (7.555)	48.532^{af}±1.194 (11.005)	7.694^{a}±0.492 (28.619)
		30^{th}	13	10.462^{a}±0.192 (6.605)	6.321^{af} ± 0.147 (8.400)	8.458^{e}±0.193 (8.229)	50.427^{ag}±1.367 (9.774)	7.693^{a}± 0.561 (26.297)

Figures bearing common superscript column-wise doesn't differ significantly

Table 3: Response of mineral mixture, Prajana and GnRH treatment on blood biochemical constituents in normal and

Figures bearing common superscript column-wise doesn't differ significantly

Table 3: Response of mineral mixture, Prajana and GnRH treatment on blood biochemical constituents in normal and anoestrus buffalo cows.

	Status of Animals	Days	No. of animals	Serum Calcium mg/100 ml	Inorganic phosphorus mg/100 ml	Total protein gm/100 ml	Blood glucose mg/100 ml	Alkaline phosphatase KAU/100 ml
NORMAL CYCLING		0	8	9.762^{bcdf}±0.239 (6.945)	6.015^{ade}±0.164 (7.714)	7.334^{*cg}±0.990 (3.845)	0.116^{*akh}±0.115 (11.932)	6.815^{a} ± 0.566 (23.507)
	Buffalo Cows	15^{th}	8	9.842^{*bcg}±0.250 (7.183)	6.102^{adgi}±0.170 (7.883)	7.596^{ag}±0.106 (3.976)	50.015^{ail}±2.137	6.861^{a}±0.565 (23.276)
							-12.002	
		30^{th}	5	9.658^{efg}±0.316 (7.310)	5.940^{adhi}±0.159 (5.993)	7.770^{ag}±0.068 (1.956)	48.150^{adjm}±2.979 (18.834)	6.914^{a}±0.926 (29.968)
ANOESTRUS		0	30	9.106^{afg}±0.201 (12.113)	4.354^{b}±0.117 (14.676)	5.880^{b}±0.170 (15.860)	46.819^{dfhij}±1.419 (16.596)	6.395^{a}±0.429 (36.732)
	Buffalo Cows	15^{th}	24	9.310^{ag}±0.189 (9.957)	5.597^{cegh}±0.146 (12.775)	6.883^{d}±0.126 (9.690)	51.459^{egkim}±0.928 (8.283)	6.451^{a}±0.451 (34.24)
		30^{th}	16	9.550^{afg}±0.258 (10.817)	6.616^{hj}±0.193 (11.684)	8.826^{f}±0.123 (7.106)	51.717^{egkim} ± 0.888 (7.005)	6.587^{a}±0.512 (31.120)

Figures bearing common superscript column-wise differ significantly (P<0.05).

Table 4: Effect of mineral mixture, Prajana and GnRH on ovulatory oestrus and conception rate in buffalo heifers and buffalo cow.

Experiment	Treatment	No. of animal treated		No. of animal showing heat		Percentage of animal showing heat		No. of animal conceived		Conception Rate (%)	
		B.H.	B.C.	B.H.	B.C.	B.H.	B.C.	B.H.	B.C.	B.H.	B.C.
1	Mineral Mixture	24	30	11	14	45.83%	86.66%	7	10	63.63%	71.42%
2	GnRH	6	8	5	7	83.33%	87.50%	4	5	80.00%	71.92%
3	Prajana Capsules	7	8	6	6	85.14%	75.00%	4	4	66.66%	66.66%
D/W Injection (Control)		8	8	8	8	100%	100%	3	3	37.50%	37.50%

B.H. : Indicate Buffalo heifers, B.C. : Indicate Buffalo cows

data were statistically analysed.

RESULTS AND DISCUSSION

The mean value of blood calcium in the normal cycling buffalo heifers and buffalo cows was 9.77 ± 0.19 to 10.13 ± 0.23 and 11.15 ± 0.11 mg/ 100 ml, respectively. In anoestrus buffalo heifers it was found to be 9.90 ± 0.10mg%. The Supplevite –M treated buffalo heifers showed significantly ($P< 0.01$) higher level of blood calcium on 15th and 30th day (Table-II). This result was comparable to that of Chauhan *et al.* (1981) and Chandolia *et al.* (1987). The mean value of the serum inorganic phosphorus in non cycling buffalo heifers (6.43 ± 0.35 mg%) was significantly ($P< 0.01$) higher than the inorganic phosphorus value recorded in anoestrus buffalo heifers (4.30 ± 0.17). Findings were in close contact of the value reported by Srivastava and Kharche (1986) for normal cycling and anoestrus buffalo heifers. The value increased significantly ($P< 0.01$) on day 30 post treatment. The mean value of blood glucose in normal cycling heifers ranged from 49.18 to 49.94 mg% in anoestrus buffalo heifers the level were found on day 0 was significantly ($P< 0.05$) lower than the day 15th. The literature available with regard to alkaline phosphatase level (Dhoble and Gupta, 1992) reveals this in normal cycling animals decreased concentration of alkaline phosphatase might enhance the follicular genesis which was contrary to the higher alkaline phosphatase detected in cycling than non-cycling buffalo heifer in present experiment. In case of buffalo cows serum calcium, serum inorganic phosphorus (0.25 ± 0.13 mg/100 ml), total serum protein (7.79 ± 0.04 mg/100 ml), blood glucose (60.88 ± 1.17 mg/100 ml) and serum alkaline phosphatase (10.70 ± 0.39 KAU/100 ml) were significantly higher than the values in anoestrus buffaloes. The treatment of anoestrus buffaloes with mineral mixture, GnRH and Prajana has been beneficial effect on resumption of estrous cycle and conception rate.

Among the treatment group GnRH was most suitable as induction of estrus (87.50%) and conception rate (71.42%) were obtained. The biochemical constituent in treated three groups increased significantly over pre-treatment values of anoestrus buffaloes and reached the level of cycling buffalo. The higher serum inorganic phosphorus concentration in similar stage of reproduction in buffalo has been reported by (Sharma *et al.*, 1991). The increase in biochemical constituent in circulation after treatment with mineral mixture, Prajana & GnRH at estrus during present experimentation agree with the similar elevation of biochemical constituents after treatment with mineral mixture in buffalo Raju *et al.*, (1991), Shanker *et al.*, (1996). Darsari *et al.*, (1984). However, low activity of alkaline phosphatase during normal reproduction and fertility has also been reported (Singh *et al.*, 1986).

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