COST EFFECTIVENESS OF OVSYNCH PROTOCOL IN DIFFERENT COMBINATIONS FOR INDUCTION OF ESTRUS IN ANESTROUS MURRAH BUFFALOES

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ABSTRACT

The present study was undertaken to study the effect of ovsynch protocol in different hormonal combinations on twenty four anestrous Murrah buffaloes (*Bubalus bubalis*), randomly divided into four equal groups. Group I was kept as untreated control. Group II received Ovsynch protocol alone where as Ovsynch + CIDR and Ovsynch + Hydroxy-progesterone were administered in group III and IV, respectively. In response to the Ovsynch treatment in different combinations 83%, 83% and 66% animals expressed estrus out of which 100%, 80% and 100% animals ovulated in Groups II, III and IV, respectively. Out of animals that expressed estrus, 60%, 20% and 0% in Groups II, Group III and Group IV, respectively were confirmed as pregnant using ultrasonography 30 days post A.I. Cost effectiveness per pregnancy in Group II and Group III was rupees 1385 and 8013, respectively. From the present investigation it can be concluded that Ovsynch alone is capable of inducing cyclicity and obtaining satisfactory conception rates in true anestrous buffaloes.

Keywords: *Bubalus Bubalis*, buffalo, anestrous, ovsynch, CIDR, hydroxyprogesterone

INTRODUCTION

Low reproductive efficiency in the buffalo remains a major economic problem globally and its incidence is higher in India (Kumar *et al*., 2009). An annual loss due to reproductive inefficiency is more than 500 crore rupees (Dairy India, 2007). Prolonged postpartum acyclicity and anestrum are major causes of economic loss to buffalo breeders (El-Wishy, 2007). Attempts have been made by various researchers to induce cyclicity in anestrous buffaloes during peak breeding and low breeding periods with the help of hormonal and non-hormonal preparations (Lakra *et al*., 2002). Favourable effects of GnRH and its analogues in inducing early postpartum ovarian activity and estrus have been reported in buffaloes (Saini and Lohan, 2003). Recently, a novel protocol, 'Ovsynch' (GnRH-$PGF_{2\alpha}$-GnRH regimen) was developed by Pursley *et al.* (1995)

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to synchronize ovulations in lactating dairy cows that was also tried in buffaloes (Malik, 2005) with variable degree of success. The precise synchrony allows for successful fixed time artificial insemination (FTAI) without the need for detection of estrus and has been applied widely in cattle breeding. However, the comparative efficacy of these hormonal regimens of ovsynch plus CIDR and ovsynch plus progesterone in Murrah buffaloes during summer season has not been attempted, so far.

MATERIALS AND METHODS

The present study was conducted during summer season at Animal Farm of the Central Institute for Research on Buffaloes Hisar, on twenty four anestrous Murrah buffaloes (*Bubalus bubalis*) possessing sound health between age group of 4 to 7 years weighing more than 500 kg body weight. The animals were diagnosed anestrous on the basis of anamnesis, two per rectal examinations at ten days apart and using real time B-mode ultrasound scanner (Just Vision 200, Model SSA-320A, Toshiba, Japan) equipped with a convex array multi-frequency transducer using frequency of 7.0 MHz. The animals were divided randomly into four equal Groups (I, II, III, and IV) having six buffaloes each. Animals in Group I were kept as untreated control and in Group II, animals were treated with ovsynch protocol only. This treatment protocol consisted of 5 ml Receptal (GnRH analogue; 10 µg Buserelin acetate) injection on Day 0 (day of start of experiment), 5 ml Lutalyse (PGF2α analogue; 25 mg Dinoprost tromethamine) plus 500 I.U Folligon (Pregnant Mare Serum Gonadotrophin) on Day 7 and 5 ml Receptal on Day 9, followed by FTAI 24 h after the 2nd GnRH injection. In Group III, buffaloes were treated with Ovsynch plus CIDR protocol and the protocol consisted of GnRH (5 ml Receptal) injection and CIDR insertion on Day 0, 5 ml Lutalyse plus injection 500 I.U Folligon on Day 7, CIDR removal on day 8 and 5 ml Receptal (2nd GnRH) on Day 9, followed by FTAI (Fixed Time Artificial Insemination) 24 h after the 2nd GnRH injection. Similarly, in group IV, buffaloes were treated with 1 ml Duraprogen (250 mg hydroxyl-progesterone caproate) subcutaneously on Day -6, -3 and 0 followed by GnRH (5 ml Receptal) injection on Day 0 (day of start of experiment), 5 ml Lutalyse plus 500 I.U Folligon on Day 7 and 5 ml Receptal (2nd GnRH) on Day 9, followed by FTAI at 24 h after the 2nd GnRH injection.

Estrus detection was carried out by visual observations and teaser bull parading daily in the morning and evening. Estrus was also confirmed by rectal palpation and ultrasound examination. Buffaloes detected in estrus were artificially inseminated with good quality frozen semen at fixed time (24 h after 2nd GnRH treatment). Corpora luteum and pregnancy were confirmed ultrasonographically on day 30 post Fixed timed insemination. The data obtained in the present study were subjected to appropriate statistical analyses to draw scientific inferences. The students't-test was used to evaluate the differences between means where two variables were involved, whereas Duncan's Multiple Range Test was used where more than two variables were involved (Snedecor and Cochran, 1994).

RESULTS AND DISCUSSION

In response to the Ovsynch treatment in different combinations 83% (5/6), 83% (5/6) and 66% (4/6) animals expressed estrus out of which 100 % (5/5), 80% (4/5) and 100% (4/4) animals ovulated in Groups II, III and IV, respectively. Out of animals that expressed estrus, 60% (3/5), 20% (1/5) and 0% (0/4) were confirmed as pregnant using transrectal real time B mode ultrasonography at day 30 post A.I. (Table 1).

Total expenditure and cost effectiveness per estrus was Rs 4155/-, 8013/-, 4677/- and Rs 831/-, 1603/-, 1169/- in Groups II, III and IV, respectively. The cost effectiveness per pregnancy was Rs 1385/- and 8013/- in Groups II and III, respectively. The total expenditure in Group IV was Rs 4677/- without any conception (Table 2). In the treatment groups, the failure of certain animals to exhibit natural estrus and subsequently failure to conceive at induced estrus is of interest. Low conception rates in Group III and IV may be due to induced estrus being anovulatory or deficient CL function leading to silent estrus or short cycle. Ali and Fahmy (2007) emphasized that induction of ovarian cyclicity is a major benefit of ovsynch program in non-cyclic buffaloes, regardless, the ovulation occurs too early and over a relatively long time, and the developed CL seems to be sub-functional. There is no parallel report in literature where analysis of cost effectiveness has been reported. The present findings suggest that ovsynch alone is capable of inducing cyclicity in true anestrous buffaloes and there seems no need of combining CIDR or Hydroxyprogesterone with ovsynch protocol which will unnecessarily increase the cost of treatment. ovsynch alone is capable of inducing cyclicity in true postpartum anestrus buffaloes and there is no need of combining CIDR or Hydroxyprogesterone with ovsynch protocol which will unnecessarily increase the cost of treatment.

ACKNOWLEDGEMENTS

The authors thank the Director Research, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar and Director, Central Institute for Research on Buffaloes, Hisar for providing necessary facilities and logistics support to conduct the study.

Table 1. Effect of Ovsynch protocol in different hormonal combinations on reproductive performance.

Experimental groups	No. of animals	Expressed estrus		Ovulated out of expressed estrus		Pregnant out of expressed estrus	
		No.	(%)	No.	(%)	No.	(%)
Control	6	0	0	0	0	0	0
Ovsynch	6	5	83%	5	100%	3	60%
Ovsynch + CIDR	6	5	83%	4	80%	1	20%
Ovsynch + P_4	6	4	66%	4	100%	0	0%

Table 2. Cost of treatment of different treatment groups on the basis of percent induced to estrus and percent pregnancy rate.

Variable	Group II (GnRH + $PGF_{2\alpha}$ + PMSG + GnRH)				Group III (CIDR + GnRH + $PGF_{2\alpha}$ + PMSG + GnRH)					Group IV (P_4+P_4+P_4 + GnRH + $PGF_{2\alpha}$ + P MSG + GnRH)						
Name of the drug used	Inj. Receptal	Inj. Lutalyse	Inj. Folligon	Inj. Receptal	CIDR insert	Inj. Receptal	Inj. Lutalyse	Inj. Folligon	Inj. Receptal	Inj. Duraprogen	Inj. Duraprogen	Inj. Duraprogen	Inj. Receptal	Inj. Lutalyse	Inj. Folligon	Inj. Receptal
Quantity (Dose) used/ animal	10µg	25 mg	500 I.U.	10 µg	One	10 µg	25 mg	500 I.U.	10 µg	250 mg	250 mg	250 mg	10 µg	25 mg	500 I.U.	10 µg
Total quantity of the drug used	60 µg	150 mg	3000 I.U.	60 µg	6 inserts	60 µg	150 mg	3000 I.U.	60 µg	1500 mg	1500 mg	1500 mg	60 µg	150 mg	3000 I.U.	60 µg
Market prices	466/40 µg	382/50 mg	537/1000 I.U.	466/40µg	643/ insert	466/40µg	382/50 mg	537/1000 I.U.	466/40µg	58/500 mg	58/500 mg	58/500 mg	466/40µg	382/50 mg	537/1000 I.U.	466/40µg
Total cost (Rs.)	699	1146	1611	699	3858	699	1146	1611	699	174	174	174	699	1146	1611	699
Total expenditure (Rs.)	4155				8013					4677						
No. of animals induced to estrus	5				5					4						
Treatment cost /animal for induction of estrus (Cost effectiveness / estrus)	831				1603					1169						
No. of pregnancies at 1st service (induced estrus)	3				1					0						
Cost effectiveness/ pregnancy	1385				8013					4677*						

*Cost involved with no results.

REFERENCES

Ali, A. and S. Fahmy. 2007. Ovarian dynamics and milk progesterone concentrations in cycling and non-cycling buffalo-cows (*Bubalus bubalis*) during ovsynch program. *Theriogenology*, **68**: 23-28.

Dairy India. 2007. *Dairy India Year Book*, 6th ed. Dairy India. New Delhi, India.

Gupta, P.R. 2007. *Dairy India 2007*, 6th ed. Dairy India Year Book, New Delhi, India.

El-Wishy, A.B. 2007. The post partum buffalo-II, acyclicity and anestrous. *Anim. Reprod. Sci*., **97**: 216-236.

Kumar, R., A. Saxena and P.S. Niranjan. 2009. Estrus detection by serum progesterone concentration in buffaloes. *Indian Vet. J*., **86**: 326-327.

Lakra, B.S., R.A. Luthra, S.K. Kha, T. Nanda and B.S. Beniwal. 2002. Title name in proceeding. *In Proceeding 18th Annual Convention of ISSAR and National Symposium*, Indian Veterinary Research Institute, Izatnagar, India.

Malik, R.K. 2005. *Studies on ovarian follicular dynamics during early postpartum period, anestrus condition and hormonal therapies for induction of estrus in Murrah buffaloes (Bubalus bubalis)*. Ph.D. Thesis, Chaudhary Charan Singh Haryana Agricultural University, Hisar India.

Pursley, J.R., M.O. Mee and M.C. Wiltbank. 1995. Synchronization of ovulation in dairy cows using PGF2α and GnRH. *Theriogenology*, **44**: 915-923.

Saini, M.S. and I.S. Lohan. 2003. Seasonal effect on induction of estrus and conception rate in postpartum buffaloes treated with GnRH, p. 127-128. *In Proceedings of 4th Asian Buffalo Congress*, New Delhi, India.

Snedecor, G.W. and W.G. Cochran. 1994. *Statistical Methods*, 8th ed. Affiliated East West Press, New Delhi, India.