SUMMARY

The work was conducted at the university livestock farm, CSK Himachal Pradesh Krishi Vishvavidyalaya, Veterinary clinical complex of Dr.G.C.Negi college of Veterinary and Animal Sciences Palampur and in field veterinary institutions from February 2009 to March 2010.

In all, 278 normal cows were inseminated during this study. These cows were divided in three treatment and one control group. Depending upon different treatments groups, human chorionic gonadotrophin (Chorulon Intervet Schering Plough India Ltd.) was injected at the dose of 1500 IU. on different days (0, 5 or 12) of estrous cycle in these cows.

The animal included in treatment group of human chorionic gonadotrophin (hCG) administration (n=187) were further sub-divided into three groups viz. the administration of hormone simultaneous to AI (day 0, group1), insemination and exogenous administration of hCG on 5th day post AI (group 2) and insemination and administration of hormone on 12th day post AI (group 3). A total of 67, 65 and 55 cows were inseminated in groups 1, 2 and 3 respectively.

In addition 91 cows presented for insemination were selected as control and these were inseminated in standing heat without any treatment. Pregnancy diagnosis was carried out 60 days post AI. Conception rates (CR) were calculated and statistically analyzed.

For plasma progesterone estimation, blood was collected from 26 cows. This included 18 animals treated with 1500 IU (5ml) hCG (Chorulon) either on Day 0 (n=6) along with AI or on Day 5 (n=6) or Day 12 (n=6) post insemination and also from control group cows (n=8). In all the animals four blood samples were collected on the day 0 (day of insemination) and on days 7, 14 and 21 (post insemination) of estrous cycle.
Out of 67 cows inseminated along with hCG administered simultaneous to AI, 41 were found pregnant. The conception rate achieved was 61.19 per cent. Among 65 cows injected hCG fifth day post AI, 41 conceived with a CR of 63.07 per cent and out of 55 cows inseminated following administration of hCG 12\textsuperscript{th} day post AI, 37 were found pregnant. The conception rate was 67.27 per cent. In the control group, 91 normal animals were inseminated without any treatment and 45 (49.45\%) were found pregnant. Clinically, 1500 IU hCG administered 12\textsuperscript{th} day post AI (67.27\%) significantly (P<0.05) improved the conception as compared to control animals (49.45\%).

Following administration of hCG simultaneous to AI, 52.63 per cent heifers (10/19) and 64.58 per cent pluriparous (31/48) cows conceived. Similarly, the conception rates achieved were 61.11 per cent (11/18) and 63.82 per cent (30/47), in heifers and pluriparous cows, respectively, injected with hCG fifth day post AI. Another 75 per cent heifers (9/12) and 65.11 per cent (28/45) pluriparous cows conceived following administration of hCG 12\textsuperscript{th} day post AI. In control group, 56.52 per cent heifers and 47.05 per cent pluriparous cows conceived, respectively. There was no statistical variation between any of the groups.

Conception rates (CR) were 64.70, 61.53 and 66.66 per cent, when hCG was administered along with insemination in first, second and third and onwards lactation animals. Corresponding CR following administration of hCG on 5\textsuperscript{th} day post AI were 61.53, 71.42 and 60.00 per cent and were 63.63, 50.00 and 72.72 per cent following administration on 12\textsuperscript{th} day post AI, respectively.

In control cows, the CR were 37.50, 44.00 and 63.15 per cent with insemination in first, second and third and onwards lactation, respectively. There was no statistical variation in any group.

Out of total 72 heifers inseminated 43 (59.72\%) conceived and among 206 cows, 121 animals became pregnant and conception rate was (58.73\%). However, the difference was statistically non significant. Lactation wise CR were 53.84, 54.83 and 65.82 per cent for first, second and third lactation cows, respectively. The conception rates were non-significantly higher in all the lactation groups as compared to control.

The mean plasma progesterone concentration on Day 0, 7 and 14 in cows treated with hCG (n=6) on day 0 was 0.26±0.06, 2.15±0.51 and 2.77±0.41 ng/ml, respectively. Similarly, the mean plasma progesterone concentration on Day 0, 7 and
14 in cows treated with hCG (n=6) 5th day post AI was 0.39±0.09, 1.9±0.37 and 3.47±0.42 ng/ml, respectively. Corresponding values on Day 0, 7 and 14 were 0.30±0.07, 2.02±0.16 and 3.55±0.43 ng/ml, respectively, when hCG was injected on Day 12th post AI (n=6). In the control cows, the mean plasma progesterone concentration was 0.47±0.34, 1.91±0.61 and 2.61±0.90 on Day 0, 7 and 14, respectively. The increase in plasma progesterone concentration on Day 7 following treatment with hCG on day 0 was non-significantly higher than other treatment groups. Similarly, an increase in plasma progesterone concentration on Day 14 following treatment with hCG on day 5 or 12 was non-significantly higher than either Day 0 or control groups.

The mean plasma progesterone concentrations in pregnant cows (n=12) were 0.39±0.08, 1.97±0.20, 3.1±0.34 and 3.33±0.24 ng/ml on day 0, 7, 14 and 21 of the cycle, respectively. In non pregnant (n=14) cows the corresponding values were 0.34±0.53, 2.0±0.23, 3.03±0.24 and 1.12±0.34 ng/ml on day 0, 7, 14 and 21, respectively.

In this study, there was no significant difference in the progesterone levels in pregnant and non pregnant animals on Day 0, 7 and 14 day post AI. However, the levels of progesterone on day 21 post AI were much higher (p<0.0001) in pregnant cows.

**CONCLUSIONS**

1. hCG administration (along with AI or during luteal phase) improved conception in treated than control animals.
2. Highest conception rates were recorded when hCG was administered on day 12 post AI.
3. The response to hCG was better in heifers than cows, when supplemented on day 12.
4. Consistently higher mean plasma progesterone concentration was recorded during luteal phase in hCG treated cows.
5. The mean plasma progesterone values were highest in cows receiving hCG on day 12 post-Al.
6. The plasma progesterone values remained higher in pregnant cows on day 21, whereas, these values were significantly low in non-pregnant cows on this day.