INTRODUCTION

India has made remarkable progress in dairy industry during last couple of decades. Presently India ranks first in milk production with about 87 million metric tones per year (FAO, 2004). With expansion of dairy industry not only the milk production but reproductive performance is also gaining more importance. Reproductive performance of a cow is directly linked with efficiency in terms of economical milk production and inter calving period is the most important factor affecting the reproductive efficiency. Maintaining reproductive rhythm properly in livestock management is an essential prerequisite for optimum production. In words of Prof. Hammonol, “the rate and efficiency of the reproductive process, is the first basis of economic production” Thus, for economizing the dairy industry and increasing the livestock production, it is essential to have a calf every year with an ideal and short calving interval. With the various reproductive disorders, mostly in abnormal puerperal period, it is difficult to achieve this goal and all the efforts to boost up the production turn to be futile.

Fertility of a cow is vitally linked with the post partum genital status including proper involution of uterus and reestablishment of the ovarian cyclicity. Ovarian changes are detectable at 5-6 days post partum by follicular growth until first ovulation which frequently occurs in cows as early as 10-15 days post partum (Morrow et al., 1966). But in most lactating cows there is suppression of follicular development immediately after calving probably due to lactation stress particularly in high yielders. Although, there are reports of estrus occurring within 34 to 54 days post-partum; the majority of such heats are of weak intensity and anovulatory (Kask et al., 2003). Almost 50% of the expected heats go undetected causing further delay in service period. Prolonged post partum anoestrus is thus a major cause of economic losses in cattle. Further, the pathological termination of pregnancy is also one of the major causes of economic set back to the livestock industry due to direct losses of the conceptus and consequent impairment of fertility, leading to longer intercalving period in such animals.

Attempts to utilize maximum reproductive ability of a cow by reducing inter calving periods involved proper management and hormonal treatment as means of initiating ovarian cyclicity at an earliest. Therefore, efforts to hasten first ovulation or the estrus may result in reducing interval from parturition to
conception. Adverse effects of genital infections on fertility have been widely reported. Kaikini and Deshmukh (1976) reported pathological termination of pregnancy in 10.29 and 7.9 percent heifers and cows respectively. Thus it is evident that the post partum events are directly related to subsequent reproduction and production. Treatment of clinical metritis has been shown to increase in large dairy herds. Early diagnosis and therapy within 20-30 days after parturition following systematic clinical examination of the cows seems to avoid unnecessary treatment and prevent severe uterine lesions which delay conception.

Effectiveness of hormonal treatment in improving the post-partum fertility is frequently demonstrated by experiments and field trials. Prostaglandin treatment is reported to be the most effective therapy for retained placenta and other puerperal infections. PGF$_2\alpha$ injection resulted in negative bacterial culture and reducing intercalving period in approximately 90 percent of cows with puerperal infections (Kosec, 2003). Jackson (1977) reported that the cows that fail to respond completely after one P.G. treatment recover after second injection 10-14 days later. It has been suggested that PGF$_2\alpha$ administration to post partum dairy cows may induce an additional estrus prior to first service, resulting in higher first service conception rate, thus showing an improvement in fertility (McClary et al., 1989). Studies have also shown that the prolonged post partum release of endogenous PGF$_2\alpha$ has been associated with rapid uterine involution (Eley et al., 1981). Treating uterine infections in the post partum period and administering PGF$_2\alpha$ as a routine treatment shows a beneficial effect in cows with or without luteal activity as evidenced by serum progesterone levels (Young et al., 1984). Thus it will be useful to determine the possible association of changes in progesterone and prostaglandin pattern in cows with or without puerperal infections and ovarian activity.

Further gonadotropin releasing hormone (GnRH) provides a new method of inducing endogenous luteinizing hormone (LH) release in farm animals. With the availability of synthetic GnRH analogues the approach to the management of sub fertility/infertility in dairy animals, has been revolutionized. Research workers suggested that, GnRH administration results in pre ovulatory surge of LH and decrease the post-partum interval to first ovulation and establish regular estrous cycles which continue until at least two months after parturition (Benmard and
GnRH may assist in uterine involution when administered 14 to 20 days after parturition. However, studies have also revealed contradictory result in initiating breeding activity (Langley and O’Farrell, 1979, Lovested, 1981). Hence, it was felt necessary to assess the utility of GnRH analogue (Receptal) for improving the post-partum breeding efficiency of cows under Nagpur climatic conditions.

The basic goal of any therapeutic measure in cases of abnormal puerperium is a return of the cow to cyclicity as soon as possible and the prevention of secondary complications which can lead to economic losses from delayed conception and resulting reduced milk production. An economic calculation made by adding the losses due to increased calving interval, increased culling rate, loss of milk production and the cost of veterinary treatment revealed that the total loss due to the retained placenta was 471 pounds per year for a 100-cow farm with an average incidence of the condition (6.6%). For a problem farm with a 30% rate, the losses were 2139 pounds per year (Joosten et al., 1988).

The present approach of manual removal of retained placenta followed by antibiotics treatments has certain drawbacks. No matter how carefully the manual removal is done, some injury to the endometrium may result and the risk of toxemia and Septicemia is thereby increased. Constant use of antibiotics involved high cost and renders milk unfit for consumption at least for 72 hours. Moreover, the risk of resistance development and reduction in natural defense mechanism of the uterus is also involved.

The post partum period is vulnerable to many disturbing influences like nutrition, lactation stress, management and climatic conditions. These factors are likely to be reflected in general metabolic activity and reproductive ability of an individual (Morrow et al., 1966). Calcium and phosphorus are the important minerals, lack of which may upset the proper functioning of reproductive organs. The role of calcium in sensitizing the tubular genitalia for action of hormones has been recognized (Moddie, 1965). The role of certain biochemical constituents such as blood glucose, serum total protein and micro minerals in various reproductive processes have been well documented (Quajam et al., 1988). It has been observed that cattle fed on calcium deficient diet have delayed uterine involution. The reproductive performance is inversely related to dietary
phosphorus intake. Very high phosphorus intake and low calcium intake also result in infertility. Variations in levels of these constituents results in abnormal parturition and retention of placenta in cows (Dutta and Dugwekar, 1984, Agarwal et al., 1985 and Rajpal and Vadnere, 1985).

Therefore, the present study was undertaken with the following objectives.

1. To study the incidence of pre-parturient, parturient and post-partum reproductive disorders in cows under Nagpur agro-climatic conditions.

2. To study the normal utero-ovarian activity in post-partum cows and to explore various factors influencing it.

3. To study the utero-ovarian activity in cows with abnormal peurperium.

4. To assess the efficacy of prostaglandins and other medicaments influencing reproductive status of cows with normal and abnormal peurperium.

5. To study the endocrinal profile of progesterone related to post partum events in normal, abnormal and treated cows.