PREFACE
The interaction among hormones like the gonadal steroids (testosterone, oestrogen and progesterone), thyroid hormones, prolactin, growth hormone and parathyroid hormone, and their cross-talk in the regulation and modulation of the inflammatory, degenerative and immunological processes associated with various diseases, has been an area of recent interest. Evidence for such interactions can be perceived by the fact that the receptors for a particular hormone, like that of oestrogen are found to exist in the thyroid gland, epididymis and the sperm, the sites which were until recently not considered as targets for oestrogen action. Similarly, thyroid hormone receptors are found in placenta, the granulosa cells in the ovary, Leydig, Sertoli and germ cells in the testis and the later mentioned sites were not accepted as target organs for thyroid hormone for a long time. In the same way, prolactin is produced by the lymphocytes and is acted upon by the same hormone. Such complex hormonal interactions between thyroid hormone, luteinizing hormone (LH) and follicle stimulating hormone (FSH), in their actions on the testis and the modulation of cortisol action on the lymphocytes and the effect of oestrogen on the function of osteoblast and osteoclasts, have come to the surface in recent years effecting a revolution in the field of integrated endocrinology and evolved interesting new fields like immuno-endocrinology and psycho immuno-endocrinology.

Hormones have many modes of action. The basic mechanism involved, being an intricate cell-cell communication is executed through receptor-mediated signal transduction. This process is alterable by changes in the tissue chemistry, thereby a hormone may have a nuclear action with delayed effect
and a cytosolic protein or membrane assisted ionophore-mediated action with immediate effect. The extent and type of action of a particular hormone can be altered by the presence of other peptide and steroid hormone molecules and some carrier protein molecule in the substrate.

Recent research has brought to the lime light an amazing fact, that almost all cellular actions, like those miniscule molecular modulations resulting in the end point actions, like heart beats, respiration, brain activity and down to cell degeneration, regeneration, repair and healing of tissues are activated by cell surface receptors like the well known G-protein coupled receptors. These receptors can be modulated intum by the hormones, cytokines, prostaglandins and immunoglobulins.

Age and sex-related differences in hormonal action, both qualitative and quantitative, have been known for a long time. Such peculiarities of the actions of testosterone, oestrogen, thyroid and growth hormone in pre-puberal, adult and old age are known to be age and gender specific. Thus, it can be noticed that the action of hormones keep undergoing temporal modifications in their effect on target organs, throughout the span of human life. The actions of oestrogen, progesterone and testosterone vary between male and female and in the different phases of menstrual cycle. It is noteworthy that gender specific difference in the susceptibility to toxic agents. The susceptibility to microbial and parasitic infections, also changes in the different phases of menstrual cycle.
The macrophages, natural killer cells (NK cells), T and B lymphocytes and mast cells, are chief modulators of inflammation, degeneration and cell death (apoptosis) at the molecular level. Since these happen to be the basic cellular mechanisms in the evolution of all diseases, these cells determine the progress or the regress of chronic diseases involving inflammation and degeneration, like rheumatoid and osteoarthritis. The various complications of neurological, dermatological, oculo retinal and bone and joints, occurring in chronic diabetes mellitus, can be understandably altered and affected by the fine-tuning of these inflammatory cells. Thus hormones, cytokines and other immuno-inflammatory cells can alter the progress and prognosis of the various morbidity factors in chronic diseases as mentioned above.

Recently, naltrexone an opioid receptor blocker, used as anti-addiction drug in high dosages upto 40mg over the last decade or so, has been shown to have wonderful, beneficial effects in the treatment of chronic inflammatory and degenerative diseases, like rheumatoid arthritis, systemic lupus erethematosis (SLE), various neurodegenerative diseases like multiple sclerosis (MS) and Parkinson’s disease (PD) in very small doses. This molecule is recently known to the medical world as low-dose naltrexone (LDN) and its wonderful effects are known to be effected by the blockade of the opioid receptors and relative increase in the levels of endorphins and enkephalins, which fine-tune the natural killer cells and macrophages, leading to the arrest and regression of the inflammatory and degenerative processes in such diseases. These “good feeling” neuro peptides are also regulated and modulated by the hormones like oestrogen, testosterone and growth hormone.
One can understand by the knowledge of the mechanism of action of LDN, that these hormones can also modulate the phenomena like the incidence of multiple-organ dysfunction, which is seen in the course of many chronic and degenerative diseases. Multiple-organ failure seems to be an untoward failure of the immune functions. In other words, there appears to be a sudden change in the function of the immune and inflammation-mediating cells ending up in the functional failure of the different organ systems. Thus, such a failure of the fighting mechanism of the body, in which the different tissues and organs take part, seems to be similar to a high voltage failure happening in the function of electrical equipments. The cascade of events involving multiple-organ dysfunction having started in the inflammed tissue site spreads to the neighbouring tissues and sets in action a relentless mechanism of a river of no return type, ending in death.

Having kindled by these available scientific data, though not much, we have tried to endeavor to undertake a study of clinical conditions of chronic inflammatory degenerative diseases and study the effect of hormones like gonadal steroids and growth hormone in these conditions. This is a humble attempt to bring to the awareness of clinicians, the molecular mechanics of the immune cells and how one can make scrupulous use of hormones in treating various conditions, which have been thus far difficult to treat. We have undertaken to treat cases of rheumatoid and osteoarthritis, chronic low back ache, chronic degenerative skin diseases like psoriasis and pemphigus, the neurodegenerative sequelae of cerebral stroke, paralysis and diabetes mellitus and lastly the multiple organ dysfunction happening in various acute
and chronic diseases, with gonadal steroids and recombinant growth hormone and study the effect. Though this method of treatment is not a specific measure against the chronic diseases mentioned, yet this treatment helps the improvement of the underlying basic disease process, viz., inflammation and degeneration, in a very big way.