ABSTRACT

The profile of glycoproteins in the pathology of Rheumatoid Arthritis was investigated by using Collagen Induced Arthritic rat model. The levels of carbohydrate components of glycoproteins like protein bound Hexoses, Fucoses, Hexosamines and Sialic acids in serum, liver, heart, kidney, testis and brain of normal and arthritic rats were estimated. Activity of glycosidases like Mannosidase, Glucosidase, Galactosidase, Fucosidase and Hexosaminidase in these tissues of normal and arthritic rats was assayed using exogenous substrates. Changes in the carbohydrate level was compared with the activity of relevant enzymes. The effects of Vitamin C, Vitamin E, Ginger, Turmeric, Sallaki and Glucosamine on these parameters were also studied.

The levels of Hexoses, Fucoses, Hexosamines and Sialic acids were increased in serum, liver, kidney and brain of inflicted rats. But the levels of these sugars declined in testis. Heart showed an increase in the concentrations of Fucoses and Hexosamines whereas the levels of Hexoses and Sialic acids were decreased. Activity of mannosidase was increased in all arthritic tissues except heart where it declined. Glucosidase activity was increased in liver, kidney and brain, but lowered in the remaining tissues. Galactosidase was more active in all the tissues except heart and kidney which recorded significant decrease in activity. Fucosidase activity was higher in tissues other than brain where it was reduced. Enhanced levels of activity was recorded for Hexosaminidase in all the tissues alike. Most of these changes were either normalized or regulated by the treatments while a few were not at all affected. The increase or decrease in these parameters were tissue specific. Effects of treatments were also diverse depending on the parameter and the tissue involved.

The inflammatory status of CIA rats was assessed by measuring the thickness of paw oedema and the anti-inflammatory effect of treatments were evaluated. Alterations in the antioxidant level in arthritis and their modulation by the treatments were also studied. Activities of Catalase and Superoxide dismutase and the levels of Glutathione, Conjugated Dienes and Malondialdehyde were the parameters examined.
Turmeric was the most effective among all in reducing the paw oedema during 30 days of treatment, followed by Sallaki. CIA rats showed decreased activities of Catalase and SOD, reduced level of Glutathione and enhanced levels of Conjugated Dienes and Malondialdehyde in all the tissues except testis for Catalase. Most of these variations were either normalized or regulated by the treatments while a few could not be modified. Effects of treatments depended on the parameters and were tissue specific.

Carbohydrate components of glycoproteins and the levels of glycosidase activity could be considered as indices of progression of arthritis and regression during treatment. Design of new drugs including phytochemicals used in combination with others would be a suitable preparation for the treatment of RA.

**Key Words:** Rheumatoid Arthritis, Collagen Induced Arthritis, Glycoproteins, Glycosidases, Antioxidants, Inflammation, Protein Bound Hexoses, Fucoses, Hexosamines, Sialic acids, Mannosidase, Glucosidase, Galactosidase, Fucosidase, Hexosaminidase, Catalase, Superoxide dismutase, GSH, Conjugated Dienes, Malondialdehyde.