Currently available steroidal and non-steroidal anti-inflammatory drugs are known to manifest a number of undesirable side effects. Several indigenous drugs have been described as useful remedies for inflammation. However, no satisfactory attempts have been made to rationalise the age-old conventional uses of these indigenous drugs. A review has been made on the herbs with reported anti-inflammatory action. Chemical constituents and medicinal uses of the selected indigenous drugs have also been discussed. The biochemistry and pharmacology of natural salts have also been reviewed.

It was reported that non-steroidal anti-inflammatory drugs protect erythrocyte membranes from hypotonic hemolysis. Based on this observation, several synthetic non-steroidal anti-inflammatory drugs [beta-methasone sodium phosphate (Betnesol), diclofenac sodium (Nac-50), oxyphenbutazone (Suganril), indomethacin (Microcid), piroxicam (Dolonek) and ibuprofen (Brufen-400)] and indigenous herbal extracts [roots of Sida retusa Linn. (Malayalam: Kurumthotti) and Sida rhombifolia Linn. (Malayalam: Anakurumthotti), water of Cocos nucifera Linn. (Coconut water), roots and
leaves of *Vitex negundo* Linn. (Malayalam: Karinochi), *Strobilanthes heymeanus* Linn. (Malayalam: Karimkurinji) and *Ricinus communis* Linn. (Malayalam: Avanakku), the whole plant of *Phyllanthus niruri* Linn. (Malayalam: Kizhikanelli) and *Hydrocotyle asiatica* Linn. (Malayalam: Kudakan), bulb of *Allium cepa* Linn. (Onion) and *Allium sativum* Linn. (Garlic), rhizome of *Curcuma longa* Linn. (Malayalam: Manjal) and leaves of *Alstonia scholaris* Linn. (Malayalam: Pala) and *Ocimum sanctum* Linn. (Malayalam: Tulasi)] were screened for possible anti-inflammatory activity.

Regarding the six clinically important non-steroidal anti-inflammatory drugs screened, all except indomethacin, piroxicam and ibuprofen, significantly stabilized the erythrocyte membrane against hypotonic hemolysis. Indomethacin and piroxicam also protected the erythrocyte membrane against hypotonic hemolysis but the effect was less significant. Ibuprofen has no significant effect. It was also observed that all the indigenous herbal extracts screened, except leaves of *Ricinus communis* Linn. and *Ocimum sanctum* Linn., significantly stabilized the erythrocyte membrane and are comparable to the synthetic non-steroidal anti-inflammatory drugs in protecting the erythrocyte membrane from hypotonic hemolysis. The indigenous drug: leaves of *Ricinus communis* Linn. stabilized the erythrocyte membrane against hypotonic hemolysis but the effect was found to be less significant. The effect of leaves of *Ocimum sanctum* Linn. was insignificant.

The selected indigenous drugs, roots of *Sida retusa* Linn., the whole plant of *Phyllanthus niruri* Linn. and *Hydrocotyle asiatica* Linn., rhizome of *Curcuma longa* Linn., leaves of *Alstonia scholaris* Linn. and roots and leaves of *Ricinus communis* Linn. which were observed to exhibit anti-inflammatory activity in the screening study were used for the detailed study. In vitro studies
were undertaken to investigate the effect of concentration of the drug and conditions of analysis such as period of incubation and tonicity on the stability of erythrocyte membrane.

It was noted that the indigenous drugs investigated, stabilized the erythrocyte membrane against hypotonic hemolysis whereas high concentration caused erythrocyte lysis. This may be due to the potentiality of the drugs to form misceller aggregates at higher concentration which is known as Critical Misceller Concentration (CMC). So when the drugs are present as miscelles above CMC, the interaction with the erythrocyte membrane results in hemolysis.

In the case of all the tested drugs, except rhizome of Curcuma longa Linn. there was an increase in protection of the erythrocyte membrane against hypotonic hemolysis with increase in the period of incubation. Rhizome of Curcuma longa Linn. significantly protected the erythrocyte membrane against hypotonic hemolysis but there was no significant change in protection with increase in the period of incubation.

The tested drugs were found to have no significant effect on the stability of erythrocyte membrane at very high tonicity or at zero tonicity. The drugs: roots of Sida retusa Linn., the whole plant of Hydrocotyle asiatica Linn. and Phyllanthus niruri Linn., and roots of Ricinus communis Linn. showed significant effect in the tonicity range of 0.4 to 0.6. Rhizome of Curcuma longa Linn. was found to show significant effect over a tonicity range of 0.32 to 0.45. Leaves of Alstonia scholaris Linn. showed significant effect when the value of tonicity is between 0.275 and 0.6. The effect of leaves of Ricinus
*communis* Linn. was found to be significant when the tonicity is between 0 and 0.29.

Experiments were also performed to confirm the observed anti-inflammatory activity of the indigenous drugs: roots of *Sida retusa* Linn., rhizome of *Curcuma longa* Linn., the whole plant of *Hydrocotyle asiatica* Linn. and leaves of *Alstonia scholaris* Linn., using animal models. The biochemical effects of oral administration of these indigenous herbal extracts on various biochemical parameters and enzymes were studied in rabbits. The biochemical parameters studied include concentration of different lipid components and protein; in the serum and other tissues, glucose level of blood, stability of erythrocytes isolated from the animals and the activity of enzymes such as alanine aminotransferase (ALT) and aspartate aminotransferase (AST) in the serum and liver of the experimental animals.

Treatment with aqueous extract of roots of *Sida retusa* Linn., rhizome of *Curcuma longa* Linn. or the whole plant of *Hydrocotyle asiatica* Linn. showed a significant decrease in per cent hemolysis showing that these drugs significantly stabilized the erythrocyte membrane against hypotonic hemolysis like clinically important non-steroidal anti-inflammatory drugs. This confirms the anti-inflammatory action of these herbal principles. Treatment with leaves of *Alstonia scholaris* Linn. also showed a decrease in per cent hemolysis showing that this drug also stabilized the erythrocyte membrane, but the effect was found significant only to a lesser extent. The effect of the above herbal principles in stabilizing the erythrocyte membrane against hypotonic hemolysis was found to be in the order:
roots of *Sida retusa* Linn. > the whole plant of *Hydrocotyle asiatica* Linn. > rhizome of *Curcuma longa* Linn. > leaves of *Alstonia scholaris* Linn.

Oral administration of aqueous extract of roots of *Sida retusa* Linn., rhizome of *Curcuma longa* Linn. or the whole plant of *Hydrocotyle asiatica* Linn. significantly reduced the glucose level of blood. Oral administration of leaves of *Alstonia scholaris* Linn. also reduced the glucose level of blood but the effect was found to be less significant.

All the above four drugs have no effect on the serum protein level. The treatment with aqueous extract of roots of *Sida retusa* Linn. or rhizome of *Curcuma longa* Linn. increased the liver protein. The liver protein concentration was also increased by treatment with the whole plant of *Hydrocotyle asiatica* Linn. or leaves of *Alstonia scholaris* Linn. but the effect was less significant.

Increased aminotransferase activity values are known to occur in joint diseases and are of diagnostic value. Oral administration of all the above four drugs reduced aminotransferase activities (AST and ALT) in serum. Treatment with aqueous extract of roots of *Sida retusa* Linn. also reduced the activities of AST and ALT in liver.

The beneficial effect of the above mentioned drugs was also found in the spectrum of lipids. Elevated lipid values are possible in inflammatory conditions. All the four drugs investigated were found to show hypolipidemic action.

The stability of hepatic lysosomes isolated from animals treated with selected indigenous herbal extracts have been studied using the subcellular
distribution of $\beta$-glucuronidase as the index of lysosomal stability. Drugs observed to stabilize erythrocyte membrane were generally found to offer significant stabilizing effect on hepatic lysosomes. This confirms the anti-inflammatory action of selected indigenous herbal principles.

Rock salt is recommended as a safer substitute for common salt for hypertensive patients in indigenous systems of medicine. A biochemical analysis was made on the three different forms of common salt, i.e., the crude crystals (marine form), the rock salt form and the commercially available refined form. It has been noted that several samples of rock salt have a concentration of potassium, lithium and calcium, not significantly different from that in crude commercial crystals of common salt. The content of sodium and sulphate are higher while the moisture content is lower in rock salt when compared to common salt. This disproves the common belief that rock salt has a lower sodium content than common salt. Thus the commonly available samples of rock salt are not safe substitutes for common salt for hypertensive patients in view of the higher sodium content in rock salt.

The mineral composition of the commercially available refined, powdered and iodized salt has also been determined and the results are compared to the composition of common salt. Iodized salt had a higher sodium content and lower potassium level than common salt. The results of these investigations and their practical nutritional implications are discussed in detail.