Psoriasis is an ancient, non-contagious, universal immune-mediated inflammatory, polygenic chronic skin disease characterized by plaques of red (erythematous), scaly and well-demarcated skin lesions formed by the abnormal differentiation and hyperproliferation of epidermal keratinocytes affecting 2-3% population worldwide. The pathogenesis of psoriasis has not been clearly understood so far. Some studies report that it is an immunological disorder having abnormal keratinocyte proliferation mediated by T lymphocytes, infiltration of T cells, macrophages, and dendritic cells (DC) into the psoriatic skin. Human IL-17 cytokine belongs to a recently discovered family of cytokines that contribute to the crosstalk between adaptive and innate immunity. IL-17 and its relative IL-17F have strong proinflammatory properties on a broad range of cellular targets, including epithelial and endothelial cells, fibroblasts, keratinocytes, osteoblasts, and monocytes/macrophages. Keratinocytes produce IL-20 in the presence of IL-22, TNF-α, and IL-17 but not IFN-γ or IL-20 itself. IL-20 is also produced by stimulated monocytes and DCs. IL-20 have an important role in the psoriasis pathogenesis, in which it inhibits the differentiation of cells, increases antimicrobial competence, and production of chemokines for neutrophils in keratinocytes. IL-22 is produced by Th17, Th22 and mucosal NK cells belonging to IL-10 cytokines family. It is hypothesized that together all these cytokines play a key role in the pathogenesis and progression of the Psoriasis.

Present study was carried out to observe the association of human cytokines IL-17, IL-20 and IL-22 in severity of psoriasis and to correlate the surface area of psoriatic lesions with quality of life in north Indian population. A total of 150 psoriatic patients (Clinically diagnosed by dermatologist) and 200 age and gender matched healthy controls were included in the study after taking written consent from them. Patients visiting skin OPD’s of various Dermatology Departments of Government Hospitals and Medical Colleges of North India were included in the study. ELISA kit method was used to detect the level of IL-17, IL-20 and IL-22 serum. Quality of life of psoriatic patient was assessed by using Psoriasis Disability Index and the severity of disease, surface area under disease was calculated using PASI calculator. To check cardiovascular stress in psoriatic patients BP, BMI and lipid profile were also done.

Maximum representation of the psoriatic patients was in the age ranged from 18-75 years with male: female ratio of 2.1:1. The demographic picture of the studied groups showed that age of onset of disease was between 21-30 years in males and 41-50 years in females. Further it was found that PASI value of psoriatic patients
calculated 15.10±11.96 (MEAN±SD), which ranged from 0.3-49.2. Body Mass Index (BMI) of psoriatic patients with mean and SD was found to be 24.89±05.17 kg/m². Observations revealed that the mean and SD serum levels of IL-17 in psoriatic patient were 143.78±33.99 pg/ml ranged from 21.00-249.31 pg/ml, while, for normal healthy controls was 32.68±18.71 pg/ml ranged from 13.00-87.00 pg/ml. Mean and SD serum level of IL-20 among studied psoriatic patient were 96.73±26.52 pg/ml ranged from 53.60-171.94 pg/ml, while, for normal healthy controls were 49.23±09.14 pg/ml ranged from 29.24-67.34 pg/ml. Mean and SD serum level of IL-22 among studied psoriatic patient were 74.42±24.08 pg/ml ranged from 29.50-150.00 pg/ml, while, for normal healthy controls were 28.01±07.86 pg/ml ranged from 16.38-40.00. As it was observed that serum cytokines were significantly elevated in psoriatic patients, thus present study correlated the elevated serum cytokines with disease severity. A strong association of human cytokines IL-17, IL-20 and IL-22 in severity of psoriasis was observed in all the patients as compared to healthy controls (p <0.0001). When compared the serum level of IL-17, IL-20 and IL-22 in male and female psoriatic patients separately we did not observe any significant difference among the two groups (>0.05). A strong association was observed in all the psoriatic patients when we correlate the surface area of psoriatic lesions with quality of life in north India (p <0.0001). We did not found any significant difference among BP, BMI and lipid profile in psoriatic patients as compared to control group and the normal values recommended by World Health Organization.

Interestingly, this is the first study comparing the serum level of human cytokines of IL-17, IL-20 and IL-22 in the severity of the psoriasis and to correlate the surface area of psoriatic lesions with quality of life in north Indian population. The present study is a contribution in the psoriasis research and provides data on total surface area affected in severe cases and its association with quality of life and also explore the role of IL-17, IL-20 and IL-22 in the severity of the psoriasis. IL-17, IL-20 and IL-22 stands as the therapeutic target in psoriasis and several new drugs should be explored which inhibit IL-17, IL-20 and IL-22 signal transduction pathways and Th 17 gene expression. So, serum level of IL-17, IL-20 and IL-22 can be useful for diagnostic purpose and helpful in the pharmacogenomics for the development of antipsoriatic drugs. Our data indicated that human cytokines IL-17, IL-20 and IL-22 were elevated in the sera of psoriatic patients and reveals that cytokine producing skin cells may play a vital role in the pathogenesis of disease.