**Methods**

*Patients and Methods*

This retrospective observational study was conducted on patients over 18 years of age who were diagnosed with chronic plaque psoriasis with or without arthritis. Patients who were prescribed biologic agents for psoriasis between January 2007 and May 2019 enrolled in the study. Data were collected from computer-based records involving six dermatology clinics that are centers for the treatment of moderate to severe psoriasis. The ethics committees of the hospitals contributing to this registry approved the study protocol.

The biologic agents used in our study were infliximab, etanercept, adalimumab, ustekinumab, and secukinumab. The following data were collected: age, sex, body mass index (BMI), smoking habit, duration of psoriasis, comorbidities, concomitant treatments, and treatment characteristics with biologics. Clinical efficacy was evaluated using the Psoriasis Area and Severity Index (PASI) scores recorded at week 0 and week 12 for both the initial and other biologic treatments. Therapy was considered to be a first-line treatment for biologic-naive patients who initiated their first biologic and second-line treatment for patients who initiated their second biologic.

Also, the mean therapy duration (weeks) for each biologic, the reduction rate in PASI scores at week 12, and the percentage of patients who underwent dose escalation were noted. Only treatment discontinuations caused by adverse events associated with a biologic, primary treatment failure, or secondary treatment failure were computed in a Kaplan-Meier analysis. The discontinuation date included the earliest date of any switches to second-line biologic therapy on the registry. This definition is in accordance with other drug survival studies in psoriasis and psoriatic arthritis [[6–10](#_ENREF_6)].

The reasons for discontinuing prior biologic therapy were classified as follows: no satisfactory response was obtained (≥50% PASI score improvement at 12 weeks; primary failure); loss of initial response over time (secondary failure); an adverse event, including drug intolerance and infusion reactions; and other (cost, frequency of hospital visits, physician’s or patient’s decision). We also analyzed characteristics including age, initial PASI score, smoking habits, and the BMI of all patients to compare the patients who did not switch with those who switched.

*Statistical Analysis*

Data were analyzed using IBM SPSS 15.0 for Windows v.21.0. (IBM Corp., Armonk, NY, USA). Descriptive statistics are given as numbers and percentages for categorical variables and as averages and standard deviations for numeric variables when appropriate. Because parametric assumptions were not met, the Kruskal-Wallis test was used to compare numeric variables between biologic agents. A subgroup analysis was performed with a Mann-Whitney U test and a Bonferroni correction. A Kaplan-Meier survival curve was used for estimating time on therapy (weeks), and a log-rank test was performed. The differences between the two groups in age, baseline PASI, BMI, sex, and smoking habits were assessed with logistic regression analysis. *p* < 0.05 was regarded as a significant difference in all analyses.