**Materials and Methods**

***Study design and database***

This study used the Korean Health Insurance Review and Assessment (HIRA) Service claims database to analyze medical data from 2007 to 2017. The Korean government operates a mandatory nationwide insurance service called the KNHI program. The HIRA database contains all claims data, covering the entire population of Korea (>50 million people). Medical institutions submit health care utilization information in electronic form for reimbursement purposes and this information is integrated into the HIRA claims database. Our nationwide population-based retrospective cohort study used HIRA database diagnoses according to International Classification of Disease, 10th revision (ICD-10) codes. The Korean government has enhanced benefit coverage for 4 major conditions: cancer, cardiovascular disease, cerebrovascular disease, and rare intractable diseases. Within this system, the KNHI service established a registration program for rare intractable diseases. BD, multiple sclerosis, and rheumatoid arthritis are categorized as rare intractable diseases. If a patient is enrolled in the registration system with a code for rare intractable diseases, he or she will pay only 10% of medical expenses. The medical specialists are responsible for the diagnoses of rare intractable diseases through medical examinations with exact diagnostic criteria. Therefore, the use of code for rare intractable diseases increases the reliability of the data.

***Study population***

BD diagnoses were based on the International Study Group diagnostic criteria for BD (recurrent oral ulceration plus at least 2 of the following: recurrent genital ulceration, eye lesions, skin lesions, and a positive pathergy test). To determine the associations between BD and other autoimmune and autoinflammatory disorders, we included all patients newly diagnosed with BD (ICD-10 code M35.2 and code for rare intractable diseases V139) between January 2012 and December 2017 (*n* = 6,448) with 5 years of washout from 2007 to 2011. Of these patients, those <20 years of age were excluded (*n* = 234). For the control cohort, an age-, sex-, index year-matched non-BD population was extracted during the same period with a ratio of 3:1 (*n* = 18,642) (Figure 1).

***Concurrent autoimmune disorders in the BD and control group***

The presence of multiple sclerosis and rheumatoid arthritis was defined as a visit to an outpatient clinic or admission with a main diagnosis of these disorders a minimum of 5 years prior to the BD diagnosis. The total observation period of this study was from January 2007 to December 2017. Rheumatoid arthritis was diagnosed by rheumatologists according to the 1987 diagnostic criteria of the American College of Rheumatology [21] before 2010, and the 2010 American College of Rheumatology/European League Against Rheumatism Collaborative Initiative [22] after 2010. The ICD-10 and concomitant rare intractable disease codes for seropositive rheumatoid arthritis are M05 and V223, respectively. This study excluded the ICD-10 code M06 of sero-negative rheumatoid arthritis to rule out misdiagnosed sero-negative arthritis of BD patients who had arthritis symptoms prior to mucosal manifestations. Multiple sclerosis was diagnosed by neurologists or rheumatologists from the medical history and neurologic examinations with magnetic resonance imaging. The ICD-10 codes and concomitant rare intractable disease codes for multiple sclerosis are G35 and V022.

The presence of chronic diseases, including diabetes mellitus, hypertension, and dyslipidemia, was also analyzed. Comorbidities were defined by a visit to an outpatient clinic or admission with a diagnosis of the ICD-10 code for diabetes mellitus (E11-14 with antidiabetic medications), hypertension (I10-13 and I15 with antihypertensive medications), or dyslipidemia (E78 with antihyperlipidemic medications) a minimum of 5 years prior to the BD diagnosis.

***Statistical analysis***

Although the comorbidities of BD have not been established, we expected that chronic diseases such as diabetes mellitus, hypertension, and dyslipidemia should be considered possible confounders and thus adjusted for in our statistical analyses. The associations between BD and autoimmune disorders were analyzed using multiple logistic regression models, and odds ratios (OR) and 95% confidence interval (CI) were presented with adjustment models. To evaluate the robustness of the associations, we performed subgroup analyses separately for age, sex, and comorbidities of diabetes mellitus, hypertension, and dyslipidemia. All statistical analyses were performed using SAS software v9.4 (SAS Institute, Cary, NC, USA).