

Heterogeneity in the association between Body Mass Index and skin clearance in Real World ustekinumab treated psoriasis patients in China

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Background

- Elevated body mass index (BMI) has been associated with reduced response to biologic therapies in moderate to severe psoriasis according to published information.
- However, the potential heterogeneity in the association between BMI and treatment response to ustekinumab in patients with moderate-to-severe psoriasis has not yet been investigated.

Objectives

- Our study aimed to examine whether the association between BMI and real world ustekinumab response varied by patient characteristics in moderate to severe psoriasis.

Methods

- The study cohort was derived from the Shanghai Psoriasis Effectiveness Evaluation Cohort (SPEECH), a prospective multicenter observational study conducted between November 2022 and March 2024. Adults with moderate to severe plaque psoriasis who initiated ustekinumab were included.
- Treatment response was assessed using time to achievement of PASI75, PASI90, PASI100, and Physician’s Global Assessment (PGA) ≤1. In addition, improvement in PASI from baseline at week 16 was analyzed as a continuous outcome.
- To investigate heterogeneity in treatment response associated with BMI, multivariable Cox proportional hazards models were applied to assess interactions between BMI and predefined demographic and clinical characteristics (Table 1). Interaction terms were tested using Wald chi-square statistics.
- For statistically significant interactions, predicted hazard ratios (HRs) were visualized using interaction plots to illustrate how the association between BMI and outcomes varied across subgroups.
- For the continuous outcome, scatter plots with smoothed curves were generated and stratified by the corresponding interacting variables.
- All analyses were adjusted for relevant covariates. Statistical significance was defined as a two-sided p value <0.05.

Results

Among 132 patients included in the study, the mean age was 45.8 years, 79.6% were male, and the median disease duration was 10 years. The median BMI was 24.5 kg/m², 32.6% had metabolic comorbidities, and the median baseline PASI was 12.5. Median times to PASI75, PASI90, PASI100, and PGA ≤1 were 16.4 (N=97), 17.0 (N=62), 24.0 (N=29), and 16.0 (N=91) weeks, respectively.

Multivariable Cox proportional hazards models identified disease duration as the patient characteristic that significantly modified the association between BMI and treatment response for time to PASI75 and PGA ≤1. No other demographic or clinical variables showed significant interactions.

Total N=132	
Age (years)	
Median (Q1-Q3)	45.8 (35.1- 60.3)
Gender n (%)	
Female	27 (20.5%)
Male	105 (79.5%)
BMI	
Median (Q1-Q3)	24.5 (22.6-27.3)
Dosage n (%)	
45 mg ustekinumab	129 (97.7%)
90 mg ustekinumab	3 (2.3%)
Baseline PASI score	
Median (Q1-Q3)	12.5 (10.2-16.7)
Baseline HADS-A	
Median (Q1-Q3)	5 (1-8)
Duration of psoriasis diagnosis (years)	
Median (Q1-Q3)	10 (5.5-19)
Type 2 diabetes n (%)	19 (14.4%)
Hypertension n (%)	32 (24.2%)
Prior systemic therapy n (%)	62 (47.0%)
Prior biologics therapy n (%)	24 (18.2%)
Prior topical therapy n (%)	116 (87.9%)
Family history of psoriasis n (%)	24 (18.2%)
Drinking history n (%)	35 (26.5%)
Smoking history n (%)	67 (50.8%)
Education (bachelor’s degree or above) n (%)	44 (33.3%)

Interaction variable*	P-value for PASI75 (N=97)	P-value for PGA ≤1 (N=91)
Duration of psoriasis diagnosis	0.0141	0.0164
Age	0.2914	0.7617
Gender	0.8012	0.1091
Baseline PASI score	0.0882	0.1072
Baseline HADS-A	0.4625	0.8263
Type 2 diabetes	0.1578	0.7889
Hypertension	0.1985	0.1525
Prior systemic therapy	0.6970	0.6799
Prior biologics therapy	0.0616	0.0893
Prior topical therapy	0.9637	0.5360
Family history	0.2681	0.2989
Drinking history	0.7630	0.5031
Smoking history	0.4127	0.2019
Education level	0.1397	0.8000

*Interaction term between BMI and each variable of patient characteristics were tested, respectively.

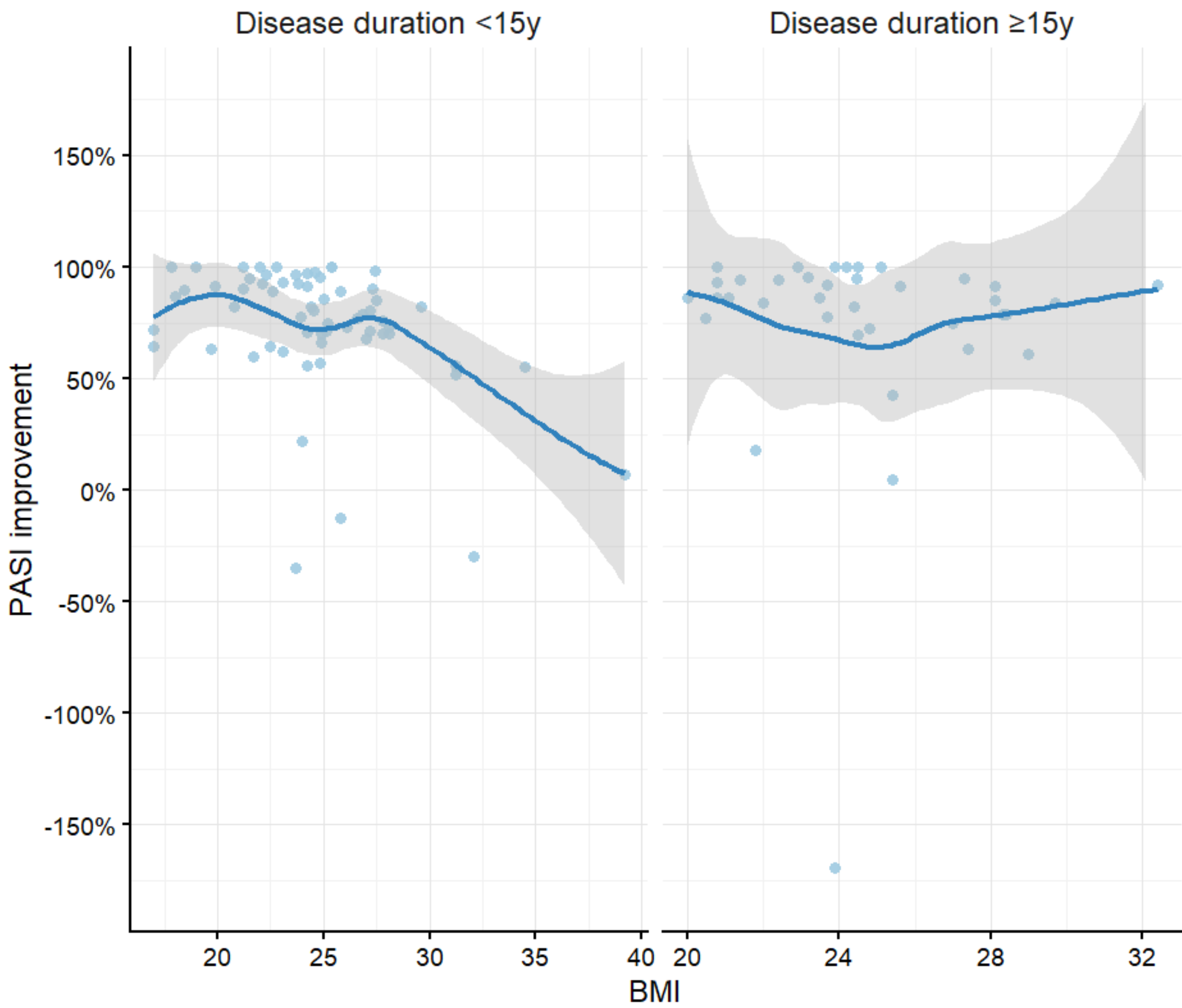
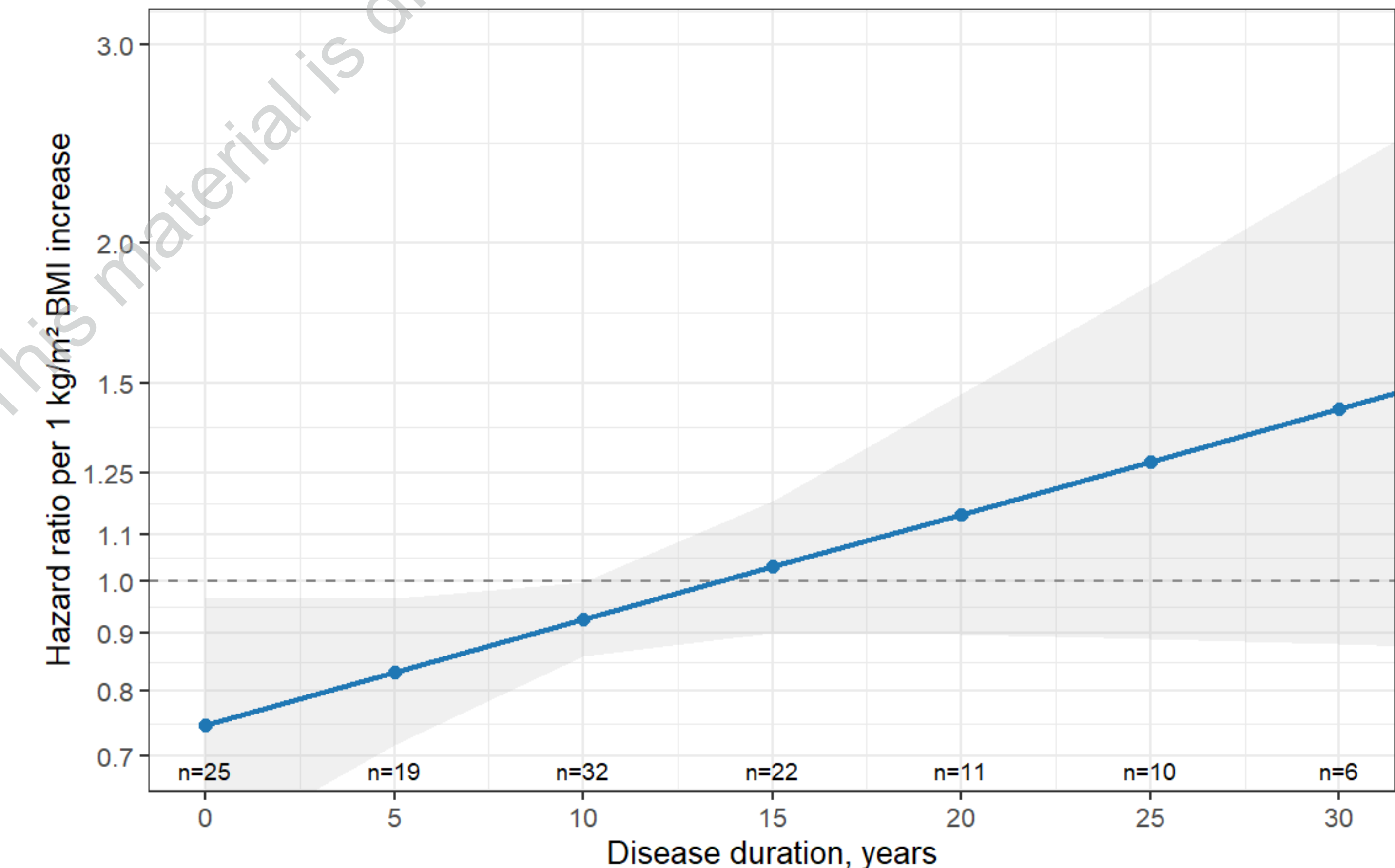
Interaction plots showed that among patients with shorter disease duration (approximately <15 years), higher BMI was associated with slower achievement of PASI75, with estimated hazard ratios consistently below 1.0.

In contrast, this association was progressively attenuated and no longer evident among patients with longer disease duration, indicating modification of the BMI effect by disease duration.

Based on this pattern, subsequent subgroup analyses were conducted using 15 years as the stratification cutoff.

In patients with disease duration <15 years, higher BMI was associated with delayed achievement of PASI75 (HR=0.88, p<0.05) and PGA ≤1 (HR=0.88, p<0.05), whereas no significant association was observed in those with disease duration ≥15 years (PASI75: HR=1.06, p=0.37; PGA ≤1: HR=1.02, p=0.80). Most patients received 45 mg ustekinumab, with only three patients treated with the 90 mg dose, all of whom had disease duration <15 years. Given the limited number of patients receiving 90 mg, ustekinumab dose was unlikely to explain the observed association.

Consistent with these time-to-event analyses, descriptive analysis of PASI improvement at week 16 showed lower PASI improvement with increasing BMI among patients with disease duration <15 years, but no clear association in those with longer disease duration.



References:
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Disclosure:
Yongjing Zhang and Hong Qiu hold stock in Johnson & Johnson. Hong Qiu, Qingqing Hu, Tong Li and Yongjing Zhang are employees of Johnson & Johnson.