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Letter

Research letter

Dupilumab reduces absenteeism in patients with moderate to severe atopic dermatitis: Pooled results from the LIBERTY AD SOLO clinical trials

To the Editor: Moderate to severe atopic dermatitis (AD) negatively affects daily functioning, quality of life (QoL), and work productivity,[1] more so for patients with inadequate symptom control.[2] The SOLO 1 and 2 phase 3 clinical trials showed that dupilumab versus placebo significantly improved signs, symptoms, and QoL in patients with moderate to severe AD, with an acceptable safety profile.[3] This study evaluated the impact of dupilumab on work/school productivity using a pooled analysis of the SOLO trials.

The designs and primary findings from the SOLO trials have been reported previously.[3] Adults with moderate to severe AD inadequately controlled by topical treatments received dupilumab (300 mg subcutaneously weekly or every 2 weeks) or placebo (subcutaneously weekly) over 16 weeks. We evaluated the mean number of missed days from work/school (absenteeism) and related costs in patients reporting full-time employment or school (≥4 days/week) and in patient subgroups categorized by baseline symptom severity, including Investigator's Global Assessment of 3 or 4, Peak Pruritus Numerical Rating Scale score of less than 7 or 7 or greater, and Dermatology Life Quality Index of less than or equal to 10 or greater than 10. Duration-adjusted annualized absenteeism rate at week 16 was estimated using Poisson regression with treatment, region, and baseline Investigator's Global Assessment strata as fixed factors and the log value of assessment days up to weeks 4, 8, 12, or 16 as offset variables. Annual productivity costs for a hypothetical cohort of 10,000 treated patients were calculated using daily labor or employee compensation costs (2018 European Union[4] and US[5] rates).

Most (72%) SOLO participants reported full-time work/school commitments, with similar baseline characteristics among groups (Table I). Absenteeism rates first collected at week 4 showed a difference between dupilumab and placebo groups (mean [standard error] missed days per patient-year: placebo, 12.1 [0.76]; dupilumab every 2 weeks, 5.4 [0.49]; dupilumab every week, 7.0 [0.55]). Annualized absenteeism rates by week 16 were significantly lower with dupilumab (Table II), with 5.6 (every 2 weeks) and 4.4 (every week) fewer missed days per patient-year versus placebo. This finding persisted in analyzed subgroups, with greater reductions in missed days among those with greater baseline AD severity (Table II). Reduced

Table I. Baseline characteristics of SOLO participants with full-time work/school commitments (full analytic sample)

Baseline characteristic	Placebo (n = 319)	Dupilumab 300 mg every 2 weeks (n = 332)	Dupilumab 300 mg every week (n = 346)
Age, y, median (Q1-Q3), range	35 (26-46), 18-64	35 (26-44), 18-77	36 (26-47), 18-80
Male sex, n (%)	185 (58)	206 (62)	228 (66)
BMI, kg/m^2, median (Q1-Q3)	25.1 (22.6-29.0)	25.2 (22.7-28.7)	25.3 (22.1-28.7)
Duration of AD, y, median (Q1-Q3)	27 (19-38)	26 (18-38)	25 (17-37)
Total EASI, median (Q1-Q3)	29 (22-42)	29 (21-40)	29 (22-43)
IGA score, n (%)			
3 (moderate)	173 (54.2)	174 (52.4)	180 (52.0)
4 (severe)	146 (45.8)	158 (47.6)	166 (48.0)
Weekly averaged Peak Pruritus NRS score, median (Q1-Q3)	7.7 (6.4-8.7)	7.7 (6.3-8.8)	7.6 (6.3-8.6)
DLQI, median (Q1-Q3)	14 (8-20)	14 (9-20)	15 (9-21)

AD, Atopic dermatitis; *BMI*, body mass index; *DLQI*, Dermatology Life Quality Index; *EASI*, Eczema Area and Severity Index; *IGA*, Investigator's Global Assessment; *NRS*, Numerical Rating Scale; *Q1*, quartile 1; *Q3*, quartile 3.

Table II. Duration-adjusted annualized absenteeism rate* per patient-year by baseline disease severity at week 16

	Placebo	Dupilumab 300 mg every 2 weeks	Dupilumab 300 mg every week
Full analytic sample			
n	319	332	346
Absenteeism rate, days per patient-year (SE)	9.1 (0.34)	3.5 (0.20)†	4.7 (0.23)†
95% CI	8.4-9.8	3.1-3.9	4.3-5.2
IGA score of 3			
n	173	174	180
Absenteeism rate, days per patient-year (SE)	6.4 (0.36)	3.5 (0.26)†	3.6 (0.27)†
95% CI	5.7-7.1	3.0-4.0	3.1-4.1
IGA score of 4			
n	146	158	166
Absenteeism rate, days per patient-year (SE)	11.3 (0.55)	3.2 (0.28)†	5.7 (0.37)†
95% CI	10.2-12.4	2.6-3.7	5.0-6.4
Peak pruritus NRS of <7			
n	100	112	114
Absenteeism rate, days per patient-year (SE)	5.0 (0.46)	1.3 (0.20)†	3.2 (0.32)‡
95% CI	4.1-6.0	0.9-1.7	2.5-3.8
Peak pruritus NRS of ≥7			
n	219	219	230
Absenteeism rate, days per patient-year (SE)	11.0 (0.44)	4.8 (0.29)†	5.7 (0.31)†
95% CI	10.1-11.8	4.2-5.4	5.1-6.3
DLQI of ≤10			
n	112	108	111
Absenteeism rate, days per patient-year (SE)	1.7 (0.26)	0.6 (0.14)†	0.9 (0.18)‡
95% CI	1.2-2.2	0.3-0.8	0.5-1.2
DLQI of >10			
n	207	224	235
Absenteeism rate, days per patient-year (SE)	13.0 (0.49)	5.0 (0.29)†	6.5 (0.33)†
95% CI	12.0-13.9	4.4-5.5	5.9-7.2

Higher scores indicate worse signs (IGA), symptoms (Peak Pruritus NRS), and negative impact on quality of life (DLQI).
CI, Confidence interval; *DLQI*, Dermatology Life Quality Index; *IGA*, Investigator's Global Assessment; *NRS*, Numerical Rating Scale; *SE*, standard error.
*Estimated using Poisson regression with treatment, region, and baseline IGA strata as fixed factors and the log value of assessment days up to weeks 4, 8, 12, or 16 used as offset variables.
†$P < .0001$ versus placebo.
‡$P < .01$ versus placebo.

absenteeism resulted in lower productivity costs with dupilumab. Annual productivity costs avoided for the hypothetical cohort (based on annualized reduction of 5.6 days per patient-year with dupilumab every 2 weeks) were US$16.2 million (United States), €15.3 million (Germany), €14.1 million (France), €12.6 million (Italy), £10.1 million (United Kingdom), and €9.5 million (Spain).

Dupilumab, thus, provided significant reductions in work/school absenteeism with associated cost savings versus placebo. Initial absenteeism and annualized reductions were greater with more severe AD and worse QoL at baseline.

Our findings may be different from a real-world population because of the controlled nature of clinical trials. The 16-week duration-adjusted analysis was extrapolated to annual estimates; the effect of long-term treatment would require further investigation. There was no baseline assessment before treatment administration, with absenteeism rates first being collected at week 4; nonetheless, subsequent productivity outcomes were markedly different. Absenteeism rates were pooled across work/school settings and countries, with inherent variability that may affect generalizability.

The productivity burden of AD on patients with inadequately controlled disease is substantial but may be ameliorated with dupilumab treatment.

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