Sustained Efficacy and Safety of Erenumab in Patients with Episodic Migraine Who Failed 2–4 Prior Preventive Treatments: 2-Year Interim Results of the LIBERTY Open-Label Extension Study

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BACKGROUND

- Erenumab, a fully human monoclonal antibody that selectively targets and blocks the canonical calcitonin gene-related peptide (CGRP) receptor,[1] is approved as a preventive treatment for migraine in adults[2]
- The double-blind treatment phase (DBTP) of the LIBERTY study (NCT03096834) demonstrated efficacy of erenumab 140 mg in patients with episodic migraine (EM) who had failed 2–4 prior preventive treatments[3]
- The 3-year open-label extension phase (OLEP) of the LIBERTY study is ongoing

OBJECTIVE

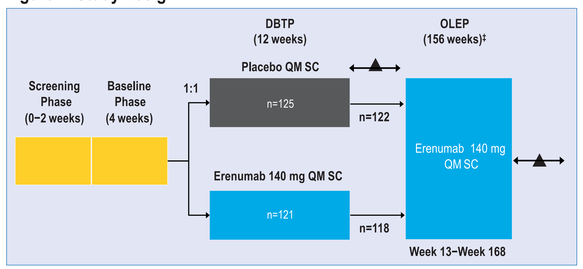
- The efficacy and safety of erenumab at Week 112 of the 3-year OLEP of the LIBERTY study is presented here

METHODS

Study Design

- In the LIBERTY study, patients (N=246) with EM (4–14 migraine days/month) who had failed 2–4 prior preventive treatments were randomised (1:1) to either placebo or once-monthly subcutaneous erenumab 140 mg and treated for 12-week DBTP[3]
- Patients completing the DBTP of the LIBERTY study (N=240) were enrolled into the OLEP for 3 years (156 weeks) and both arms received erenumab 140 mg (**Figure 1**)

Figure 1. Study Design



←▲→Follow-up phase 16 weeks after the last dose of the study drug. ‡The open-label extension phase is ongoing.
DBTP, double-blind treatment phase; EM, episodic migraine; OLEP, open-label extension phase; SC, subcutaneous; QM, once a month

Outcomes Measured During the Study through Week 112

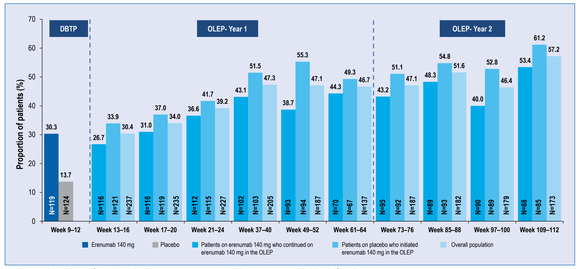
- Achievement of ≥50%, ≥75%, 100% reduction in monthly migraine days (MMD; responder rate) compared to the DBTP baseline
- Change in MMD from the DBTP baseline
- Change in Headache Impact Test (HIT-6™) total score from the DBTP baseline
- Change in Everyday Activities (EA) and Physical Impairment (PI), as measured by the MPFID, from the DBTP baseline
- Reporting of adverse events (AEs)

RESULTS

Efficacy

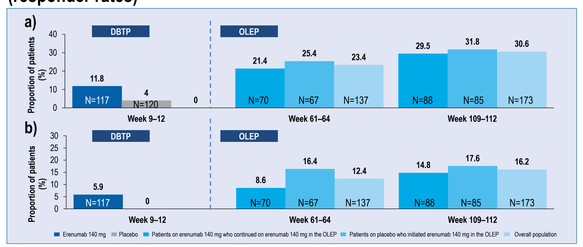
- The ≥50% responder rate remained stable through the second year of treatment in both patients groups similar to what was observed during the first year of the OLEP (**Figure 2**)
- The ≥75% and 100% responder rates demonstrated sustained improvement during 2 years of the OLEP (**Figure 3**)

Figure 2. ≥50% Reduction in MMD (responder rate)



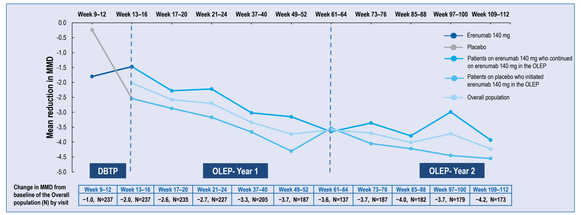
N, the total number of patients in the treatment group with response variable defined
DBTP, double-blind treatment phase; MMD, monthly migraine days; OLEP, open-label extension phase

Figure 3. a) ≥75% Reduction in MMD and b) 100% Reduction in MMD (responder rates)



N, the total number of patients in the treatment group with response variable defined
DBTP, double-blind treatment phase; MMD, monthly migraine days; OLEP, open-label extension phase

Figure 4. Change in MMD from Baseline until Week 112 of the OLEP



Change in MMD from baseline of the Overall population (N) by visit	Week 9–12	Week 13–16	Week 17–20	Week 21–24	Week 37–40	Week 49–52	Week 61–64	Week 73–76	Week 85–88	Week 97–100	Week 109–112
	−1.0, N=237	−2.0, N=237	−2.6, N=235	−2.7, N=227	−3.3, N=205	−3.7, N=187	−3.6, N=137	−3.7, N=187	−4.0, N=182	−3.7, N=179	−4.2, N=173

DBTP, double-blind treatment phase; MMD, monthly migraine days; OLEP, open-label extension phase

Functional Outcomes

- A consistent improvement was also observed in functional outcomes, as measured by HIT-6™ and MPFID scores, from Week 12 (DBTP) through Week 112 in the OLEP (**Table 1**)

Table 1. Other Observed Efficacy Outcome Measures in 112 Weeks of the LIBERTY Study (open-label analysis set)

Outcomes	Time point (Week)	Patients on erenumab 140 mg who continued on erenumab 140 mg in the OLEP, N=118	Patients on placebo who initiated erenumab 140 mg in the OLEP, N=122	Overall population, N=240
Change from the DBTP baseline in HIT-6™*	12	−5.2 (6.6)	−2.3 (5.9)	−3.7 (6.4)
	60	−8.5 (7.4)	−9.7 (10.0)	−9.0 (8.7)
	108	−8.5 (8.0)	−10.4 (9.3)	−9.5 (8.7)
Change from the DBTP baseline in MPFID-PI	12	−2.0 (8.7)	1.3 (8.9)	−0.3 (9.0)
	64	−5.2 (6.9)	−4.5 (8.4)	−4.9 (7.6)
	112	−4.1 (9.1)	−5.0 (11.4)	−4.5 (10.3)
Change from the DBTP baseline in MPFID-EA	12	−3.3 (8.8)	0.4 (8.9)	−1.4 (9.0)
	64	−6.6 (7.7)	−5.1 (9.3)	−5.9 (8.5)
	112	−4.9 (9.7)	−6.0 (10.9)	−5.4 (10.3)

Data are mean (SD). *HIT-6 total score was assessed by visit. DBTP, double-blind treatment phase; EA, everyday activities; HIT-6, Headache Impact Test; MPFID, Migraine Physical Function Impact Diary; OLEP, open-label extension phase; PI, physical impairment; SD, standard deviation

Safety

Table 2. The Exposure-Adjusted Patient rates of AEs per 100 Patient-Years in the OLEP (open-label analysis set)

Event	Patients on erenumab 140 mg who continued on erenumab 140 mg in the OLEP, N=118, n (%) / e [r]	Patients on placebo who initiated erenumab 140 mg in the OLEP, N=122, n (%) / e [r]	Overall population, N=240 n (%) / e [r]
Any AE	97 (82.2) / 61.5 [157.6]	110 (90.2) / 43.0 [255.7]	207 (86.3) / 104.6 [198.0]
Any SAE	11 (9.3) / 199.3 [5.5]	14 (11.5) / 199.1 [7.0]	25 (10.4) / 398.4 [6.3]
Any AE leading to discontinuation of treatment	4 (3.4) / 209.8 [1.9]	5 (4.1) / 213.1 [2.3]	9 (3.8) / 422.9 [2.1]
All serious treatment-emergent AEs	11 (9.3) / 199.3 [5.5]	14 (11.5) / 199.1 [7.0]	25 (10.4) / 398.4 [6.3]
Any treatment-related AE	21 (17.8) / 175.8 [11.9]	45 (36.9) / 158.4 [28.4]	66 (27.5) / 334.2 [19.8]
Most frequently reported treatment-emergent AEs (per 100 patient-years) during the OLEP, by preferred term			
Nasopharyngitis	39 (33.1) / 158.2 [24.6]	60 (49.2) / 133.4 [45.0]	99 (41.3) / 291.6 [33.9]
Influenza	13 (11.0) / 193.1 [6.7]	26 (21.3) / 186.5 [13.9]	39 (16.3) / 379.6 [10.3]
Back pain	11 (9.3) / 195.8 [5.6]	15 (12.3) / 197.8 [7.6]	26 (10.8) / 393.6 [6.6]
Sinusitis	9 (7.6) / 200.5 [4.5]	11 (9.0) / 205.1 [5.4]	20 (8.3) / 405.6 [4.9]

N, number of patients in the analysis set; n, number of patients reporting at least one occurrence of an adverse event in that class; e, sum across all patients, the total time at risk in the OLEP in years; r=exposure-adjusted subject rate per 100 patient-years (n/e*100). MedDRA Version 22.1 has been used for the reporting of adverse events. Preferred terms are sorted in descending frequency of AEs in the 'Overall population' column.
AE, adverse events; OLEP, open-label extension phase; SAE, serious adverse events

CONCLUSIONS

- Efficacy of erenumab was sustained throughout 2 years of treatment with erenumab 140 mg in a difficult-to-treat patient population with 2–4 prior preventive treatment failures
- Treatment with erenumab improved the migraine frequency and the functional outcomes up to 1 year and the effect was sustained through the second year in both, the continuous erenumab and initiating erenumab treatment arms during the OLEP
- Erenumab was well tolerated and reported safety was aligned with the known safety profile

REFERENCES

1. Shi L, et al. *J Pharmacol Exp Ther*. 2016;356:223–23.
2. Aimovig EMA https://www.ema.europa.eu/en/medicines/human/EPAR/aimovig accessed on 21 April 2020.
3. Reuter U, et al. *Lancet*. 2018;392:2280–87.

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