Self-administration of Mepolizumab Liquid Using a Single-use Prefilled Syringe

Poster No. P697 (A1306)

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Background

- Mepolizumab is approved as an add-on maintenance treatment for patients with severe eosinophilic asthma (SEA) and has been shown to be well tolerated, reduce blood eosinophil counts, and asthma exacerbations, and improve lung function and health-related quality of life.[1–6]
- Currently, mepolizumab is supplied as a lyophilized formulation to be reconstituted prior to subcutaneous (SC) injection, and is administered once every 4 weeks by a healthcare professional (HCP) in the clinic.[1]
- A new formulation of mepolizumab as a liquid drug product in a single-use, ready-to-use prefilled syringe (PFS) or prefilled autoinjector has been developed. Administration via either device has been shown to have a statistically comparable pharmacokinetic profile to that of the reconstituted lyophilized formulation (see related posters: Shabbir et al. P702 [A1311] and Chapman et al. P696 [A1305]).

Objective

- To evaluate the usability of mepolizumab self-administered via a PFS by patients with SEA, or their caregivers, both in clinic and at home.

Methods

- This open-label, single-arm, repeat-dose, multicenter, Phase IIIa study (205667; NCT030213040) included patients ≥12 years of age, diagnosed with asthma[7] for ≥2 years, who were either receiving mepolizumab (100 mg SC) prior to screening or not.
- Mepolizumab (100 mg SC; 1.0 mL) was self-administered via a PFS once every 4 weeks over 12 weeks. If the caregiver performed the injections, all doses were injected by the same caregiver.
- The first and third dose (Weeks 0 and 8, respectively) was self-administered under observation in clinic, whilst the second dose (Week 4) was self-administered unobserved at home.
- Injection success was determined by the investigators/site staff based on Observer and At-home Checklists, and visual inspection of the returned PFS.
- The primary and secondary endpoints were the proportion of patients who successfully self-administered their third and second doses of mepolizumab, respectively.
- Other endpoints included the proportion of patients able to successfully self-administer all three doses, device usability and functionality, and safety assessments.
- The analysis population included all patients who attempted ≥1 self-administration of mepolizumab using a PFS.

Results

- In total, 56 patients (or their caregivers) self-administered ≥1 mepolizumab dose and 55 patients completed the study. Patient demographics and baseline disease characteristics are shown in **Table 1**.
- Overall, seven patients had their caregiver perform the first injection.
- All patients attempting an injection were reported by the investigator/site staff to have successfully self-administered their second and third mepolizumab dose (**Table 2**).

Table 1. Demographics and baseline disease characteristics

	Mepolizumab PFS (N=56*)
Females, n (%)	33 (59)
Age (years)† Mean (SD) Range	 50.8 (13.0) 15–74
BMI (kg/m²), mean (SD)	31.1 (8.5)
Disease duration (years) Mean (SD) Range	 22.3 (14.7) 2–57
Patients not currently receiving mepolizumab, n (%) Screening blood eosinophil count, cells/µL, median (range), n=32	33 (59) 325 (100–1420)

*55 patients completed the study, one patient was withdrawn owing to a lack of efficacy; †birth day and month was imputed with 30 June.
BMI, body mass index; SD, standard deviation

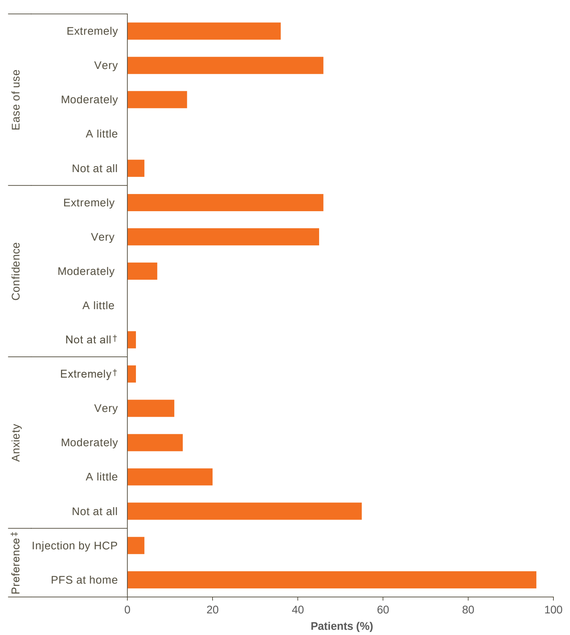
Table 2. Proportion of patients (or their caregivers) successfully able to self-administer mepolizumab (100 mg SC) using a PFS by visit

	Attempted injections	Successful injections*	
Visit	**n**	**n (%)**	**95% CI (%)**
Week 0, first dose (observed in clinic)	56	56 (100)	(94, 100)
Week 4, second dose (unobserved at home)	56	56 (100)	(94, 100)
Week 8, third dose (observed in clinic)	55	55 (100)	(94, 100)
Weeks 4 and 8	55	55 (100)	(94, 100)
Weeks 0, 4, and 8 (all doses)	55	55 (100)	(94, 100)

*The denominator for the percentage of successful injections was the number of attempted injections.
CI, confidence interval

- Patient/caregiver perception of PFS usability is summarized in **Figure 1**. Of those patients receiving mepolizumab at screening, 96% (n=22/23) preferred receiving mepolizumab using the PFS at home compared with an injection administered by a HCP in the clinic.

Figure 1. Patient/caregiver perception of PFS usability*



*Patients (n=56) were asked the following questions: how easy was it to give yourself an injection using the safety syringe at home?; at the end of the study, how confident were you about your ability to use the safety syringe in the correct way on your own when you were not at the doctor's office?; how anxious did you feel about administering mepolizumab using the safety syringe at home?; what is your preference for receiving mepolizumab using the safety syringe at home or by injection administered by a doctor/nurse?; †this patient was withdrawn from the study due to lack of efficacy; ‡refers to patients receiving mepolizumab at baseline (n=23).

- Immediately after the first injection, 64% of patients reported pain, which was generally mild and considered acceptable. At 1 hour and 24 hours following each injection, the proportion of patients experiencing pain decreased as did the relative degree of pain reported (**Table 3**).
- Overall, the incidence of on-treatment, drug-related adverse events (AEs) was low (4%) and no fatal serious AEs were reported. The incidence of anti-drug antibodies was low (4%) and none were neutralizing.

Table 3. Injection pain summary

	Mepolizumab PFS (N=56) No. of patients, n (%)		
	Time following self-administration		
Dose interval	**Immediately**	**1 hour**	**24 hours**
Week 0, first dose, n	56	51	53
Patients experiencing any pain (VAS score >0)	36 (64)	15 (29)	16 (30)
Pain acceptable*	36 (100)	15 (100)	16 (100)
Pain greater than expected	4 (11)	1 (7)	0
VAS score			
Mean (SD)	9.1 (13.9)	2.2 (6.0)	1.8 (4.9)
Week 4, second dose, n	41	42	46
Patients experiencing any pain (VAS score >0)	22 (54)	16 (38)	11 (24)
Pain acceptable*	22 (100)	16 (100)	10 (91)
Pain greater than expected	1 (5)	3 (19)	1 (9)
VAS score			
Mean (SD)	5.4 (10.0)	3.5 (11.9)	2.1 (8.9)
Week 8, third dose, n	47	47	46
Patients experiencing any pain (VAS score >0)	24 (51)	11 (23)	11 (24)
Pain acceptable*	24 (100)	11 (100)	11 (100)
Pain greater than expected	6 (25)	2 (18)	2 (18)
VAS score			
Mean (SD)	4.6 (11.6)	1.1 (2.8)	0.9 (2.3)

*All patients were asked if the pain was acceptable, despite the degree of pain experienced and the relative pain to expectation.
VAS score: 0 (no pain) to 100 (worst possible pain). VAS, visual analogue scale

Conclusions

- Mepolizumab (100 mg SC) was self-administered successfully by patients (or their caregivers) using a PFS both in the clinic and at home.
- The safety profile was similar to that observed in previous trials with the reconstituted lyophilized formulation[2–5] and no new safety concerns were identified over the 12-week treatment period.
- Overall, these results demonstrate that mepolizumab administered via a ready-to-use PFS by patients (or their caregivers) is a convenient and flexible alternative to the current reconstituted lyophilized formulation delivered in the clinic.

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