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Evolution of the RebiSmart® Autoinjector Device in Support of Adherence to Subcutaneous Interferon Beta-1a Therapy for Relapsing Multiple Sclerosis

L. Arnaud[1], M. Keiser[1], E. Henninger[2], F. Piras[1], A. Seitzinger[3], D. Jack[4], Q. Le Masne[5]

[1]Ares Trading S.A. Eysins, Switzerland (an affiliate of Merck KGaA); [2]Evi-Science, Geneva, Switzerland; [3]Merck Healthcare KGaA, Darmstadt, Germany; [4]Merck Serono Ltd, Feltham, UK (an affiliate of Merck KGaA); [5]Merck Santé S.A.S., Lyon, France (an affiliate of Merck KGaA)

CONCLUSIONS

The existing RebiSmart® autoinjector device is associated with high rates of adherence and persistence

The formative study of an updated version of the device identified several strengths and opportunities for improvement, which have been implemented as part of a commitment to improving the care of people with relapsing MS

INTRODUCTION

- People with multiple sclerosis (MS) that demonstrate good adherence to their treatment have a decreased risk of relapse, a lower frequency of hospital visits, and an increased quality of life compared to those who are non-adherent[1]
- The RebiSmart® autoinjector device helps people with relapsing MS to adhere to treatment with subcutaneous interferon beta-1a (sc IFN β-1a)
- The design of the device has constantly evolved to meet the changing needs of people with relapsing MS

OBJECTIVES

To report on adherence to/persistence with the existing RebiSmart® autoinjector device among people receiving sc IFN β-1a for relapsing MS

To describe the results of a formative study designed to evaluate the updated RebiSmart® 3.0 device

METHODS

- Adherence and persistence data with the existing RebiSmart® device were derived from the anonymised MSdialog database (database closure, November 2019)
- **Adherence** was calculated as the number of injections recorded / the number of injections prescribed, and calculated on a monthly basis
- **Persistence** was determined as the duration (in months) between first and last recorded use of the device
- Descriptive and multivariate analyses were performed on data concerning the first 3 years of use (device lifetime)
- Several factors were assessed for their impact on adherence and persistence: **age**, **sex**, **injection type** at the start of device use (titration or full), and **injection depth** when first using the device (4–6 mm, 8 mm, or 10 mm)
- In parallel, a formative study evaluated an updated version of the device, with adults with MS, adolescent proxy subjects, and MS nurses, in order to validate design improvement and inform future summative studies
- Participants performed several scenarios or knowledge tasks associated with operation of the device. After the participant performed each use scenario or knowledge task, the study moderator asked several open-ended questions to gather the participant's initial feedback

RESULTS

Adherence and Persistence With the Existing Device

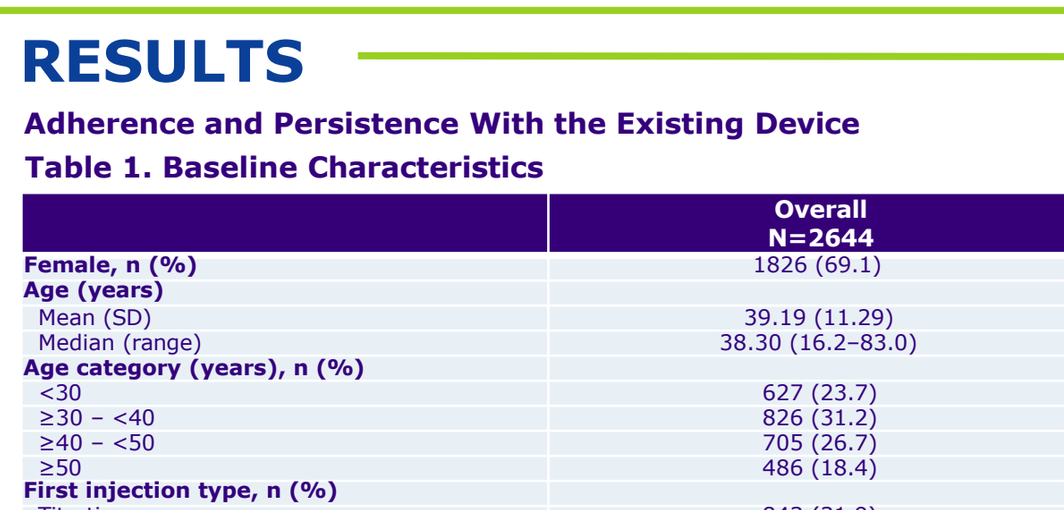
Table 1. Baseline Characteristics

	Overall N=2644
Female, n (%)	1826 (69.1)
Age (years)	
Mean (SD)	39.19 (11.29)
Median (range)	38.30 (16.2–83.0)
Age category (years), n (%)	
<30	627 (23.7)
≥30 – <40	826 (31.2)
≥40 – <50	705 (26.7)
≥50	486 (18.4)
First injection type, n (%)	
Titration	843 (31.9)
Full	1801 (68.1)
First injection depth, n (%)	
4–6 mm	329 (12.4)
8 mm	751 (28.4)
10 mm	1564 (59.2)

Q1,Q3, quartile 1, quartile 3; **SD**, standard deviation

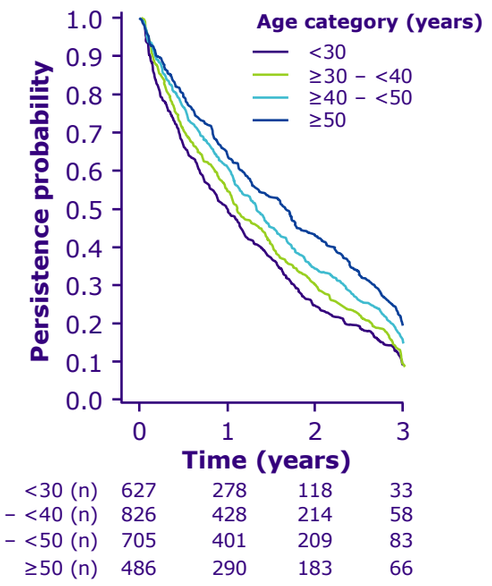
- A total of 2644 existing device users were evaluated (median age, 38.3 years; females, 69.1%) (**Table 1**)
- Over 3 years, there was a trend for higher adherence with increasing age of users (**Figure 1**)

Figure 1. Adherence Over Time, by age



- Monthly adherence averaged **~85%** for males and females alike; similar findings were apparent for injection type. There was a trend for higher adherence with deep injection (**Supplementary Figures 1–3**)

Figure 2. Kaplan-Meier Curve of Persistence, by age



- Mean persistence (standard deviation) with the existing device was **1.35 (1.06) years**
- A trend for higher persistence with increasing age of users was apparent (**Figure 2**), but persistence tended to be lower for females. There was no relevant impact of injection depth on device persistence (**Supplementary Figure 4**)

SCAN HERE FOR ADDITIONAL CONTENT

Formative Study

- In the formative study of the updated device, participants (n=9) identified several **strengths**:

Ease of use | **Size of device** | **Sound prompts** | **Screen clarity** | **Device safety**

- Opportunities for **improvement** included:
  - Consideration of dexterity among people with relapsing MS
  - Modification of on-screen functionality
- Further information is provided in **Supplementary Table 1**

REFERENCE: 1. Kołtuniuk A, Chojdak-Łukasiewicz J. *Int J Environ Res Public Health*. 2022;19:2203.

DISCLOSURES: LA and **FP** are employees of Ares Trading S.A. Eysins, Switzerland (an affiliate of Merck KGaA). **MK** is a former employee of Ares Trading S.A. Eysins, Switzerland (an affiliate of Merck KGaA; current affiliation: EMD Serono, Inc., Rockland, MA, USA [an affiliate of Merck KGaA]). **EH** is an employee of Evi-Science, Geneva, Switzerland and provides statistical consultancy to Merck. **AS** is an employee of Merck Healthcare KGaA, Darmstadt, Germany. **DJ** is an employee of Merck Serono Ltd, Feltham, UK (an affiliate of Merck KGaA). **QLM** is an employee of Merck Santé S.A.S., Lyon, France (an affiliate of Merck KGaA).

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