

Growth Hormone Treatment Adherence in Latin American Patients: 2-year Real-world Data from the easypod™ connect eHealth Platform

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INTRODUCTION

- Poor adherence to long-term treatment with growth hormone (GH) is known to affect final growth and other clinical outcomes.¹
- Real-world adherence to GH treatment has always been difficult to monitor and is usually assessed by proxy methods, such as patient testimony or prescription records.²
- The easypod™ injection device allows automatic recording and transmission of adherence data from patients receiving recombinant human growth hormone (r-hGH; Saizen) to treat growth disorders.³
- Through the easypod connect ecosystem, healthcare professionals can access transmitted data and gain insights into adherence patterns.³
- An observational study using easypod connect (ECOS) has shown that most patients maintained an adherence rate of ≥80% over 3 years of easypod use.³
- A previous analysis in a real-world setting, conducted exclusively in Latin American (LATAM) patients using easypod connect, has shown that most patients maintain high adherence, with girls and younger patients being the most adherent.⁴

OBJECTIVES

- This analysis aimed to evaluate real-world adherence to r-hGH therapy administered via easypod at 1, 3, 6, 12 and 24 months, plus overall data at 48 months in LATAM children, and assess the effects of age, sex, and engagement with treatment on adherence.

METHODS

- This was an exploratory cross-sectional descriptive analysis study.
- Records from 4,530 children transmitting to easypod connect in nine LATAM countries were analyzed (Figure 1).
- The period of recorded data varied according to the length of each individual's treatment.
- Only children with at least 10 injections registered on easypod were analyzed, to exclude test/training injections.
- Adherence was assessed at Month 24 (1, 3, 6, 12, 24 months) and overall at Month 48.
- Adherence was calculated as mg of GH injected vs. mg prescribed (dosage and frequency as per easypod settings defined by a healthcare professional) and categorized as high (≥85%), intermediate (>56%–<85%) or low (≤56%).
- Adherence was categorized according to sex and nominal puberty status, with age cut-offs at 10 years for girls and 12 years for boys.¹
- Adherence was recorded for the cross section of children/caregivers transmitting data at each time point and no imputation was made for missing data or withdrawal.
- For each adherence cohort, the mean number of transmissions was used as a measure of engagement in disease management.

Figure 1. Participating LATAM Countries



RESULTS

Patient Demographic

- Data were downloaded on 15th February 2019; overall, 4,459 patients transmitted data for >10 injections.

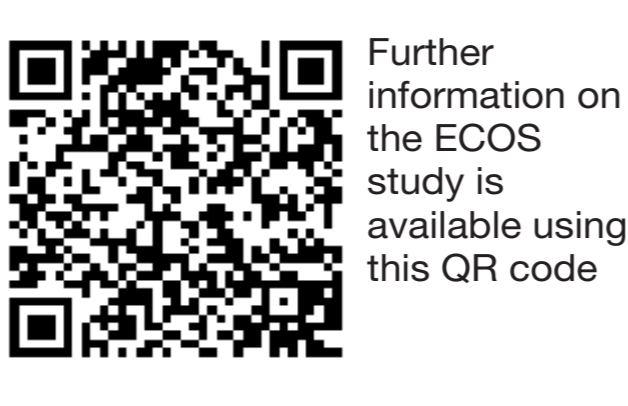
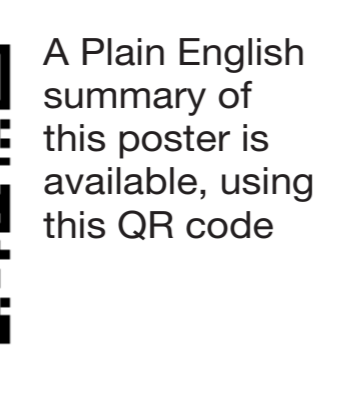
Data Transmissions According to Adherence rates

- Children in the high- and intermediate adherence categories had the highest mean number of data transmissions (5.1 [SD 9.9] and 4.9 [SD 9.4] respectively) compared with the low adherence category (2.5 [3.5]; Table 1).

Table 1. Overall Patient Demographics According to Adherence Rates

Characteristics	Adherence ≥85% (N=2719)	Adherence >56%–<85% (N=1267)	Adherence ≤56% (N=473)
Boys, mean age, years (SD)	12.2 (4.1)	13.3 (4.7)	13.9 (7.1)
Number of boys <12 years/12+ years	589/941	215/521	85/206
Girls, mean age, years (SD)	11.3 (3.2)	12.5 (5.6)	13.5 (7.8)
Number of girls <10 years/10+ years	293/896	107/424	41/141
Mean (SD) total number of transmissions	5.1 (9.9)	4.9 (9.4)	2.5 (3.5)

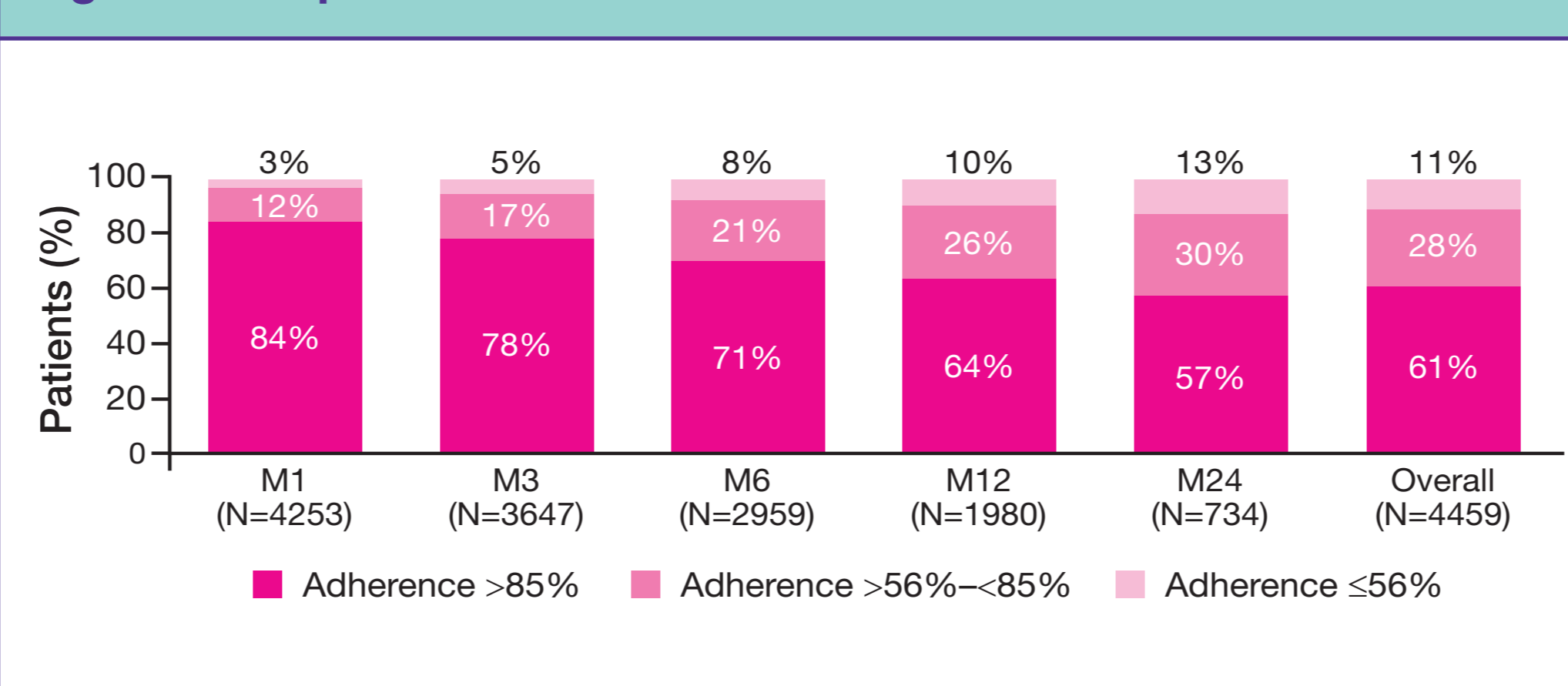
SD, standard deviation



Proportion of Patients in Each Adherence Category at Each Time Point

- Overall, 61% of children were in the high adherence category, 28% were in the intermediate adherence category and 11% were in the low adherence category (Figure 2).
- At each time point, there was a higher proportion of patients in the high adherence category than in the other two categories combined.
- There was a decrease in the proportion of patients in the high adherence category at each time point; however, at Month 24, 57% patients (422 of 734) were still in the high adherence category.
- Patient flow through the adherence categories over 24 months is shown Figure 3.

Figure 2. Proportion of Patients Adherent at Each Time Point



Note: 'Overall' is defined as the total number of patients who received GH for which data are available.

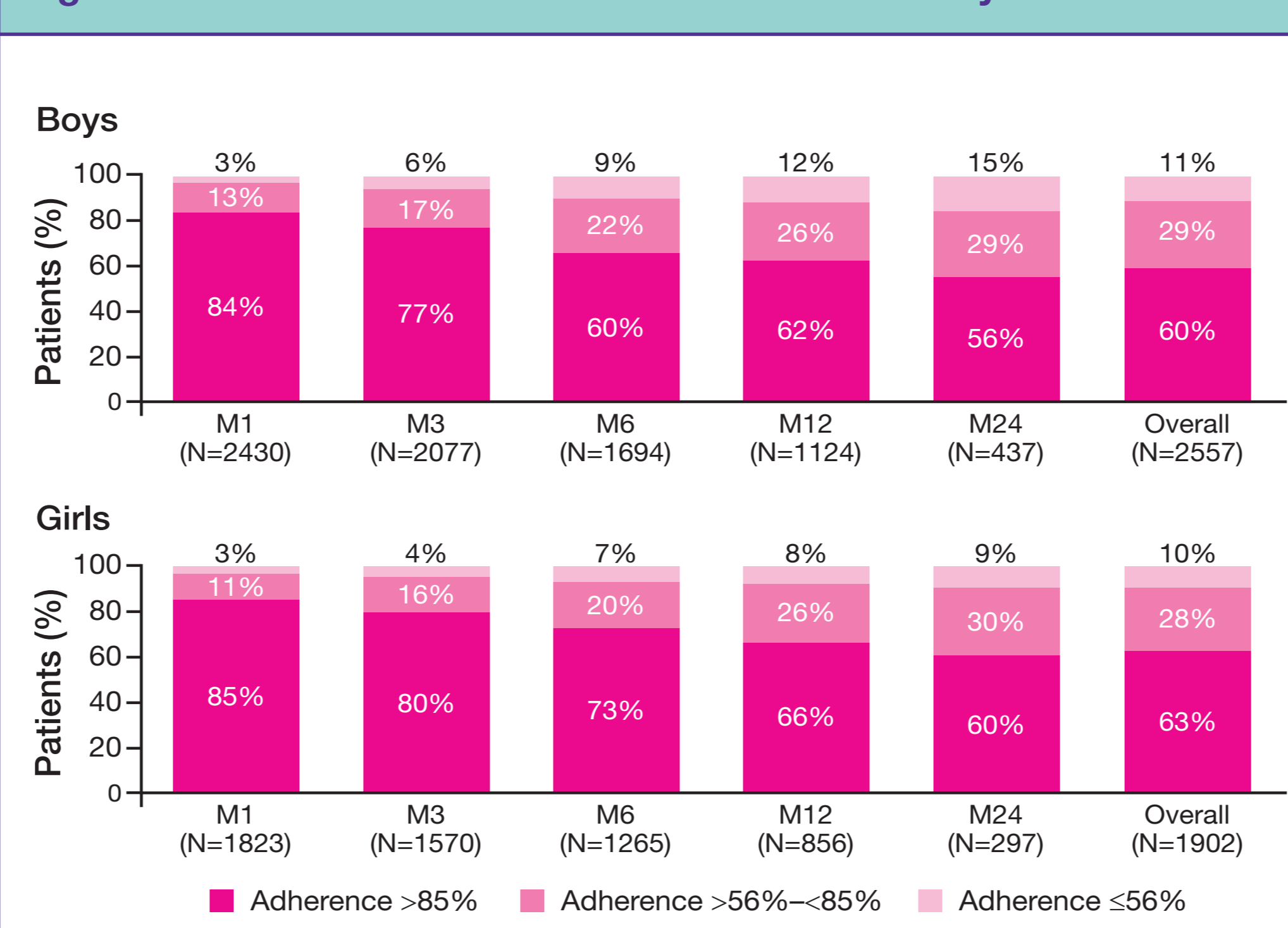
Adherence at Each Time Point Stratified by Sex

- At Month 24, more girls than boys were in the high-adherence group (179 of 297 [60%] vs. 243 of 437 [56%]; Figure 4).
- A similar trend was noted at each time point.

Adherence at Each Time Point Stratified by Age

- At Month 24, a slightly higher proportion of younger children recorded high-adherence data compared to older patients (Figure 5).
- 57 of 100 (57%) boys aged <12 years vs. 186 of 337 (55%) boys aged ≥12 years.
- 38 of 59 (64%) girls aged <10 years vs. 141 of 238 (59%) girls aged ≥10 years.

Figure 4. Adherence at Each Time Point Stratified by Sex



Note: 'Overall' is defined as the total number of patients who received GH for which data are available.

DISCUSSION

- Real-world evidence from the easypod connect system suggested that high adherence was seen in children using easypod.
- The LATAM data were consistent with the global real-world evidence.⁴
- The adherence rate varied from child to child, and not all data were available for all patients.
- No conclusions can be drawn about the adherence trends over time of individual children due to the cross-sectional nature of the study.

Figure 3. Sankey Diagram of Patient Flow by Adherence at Each Time Point

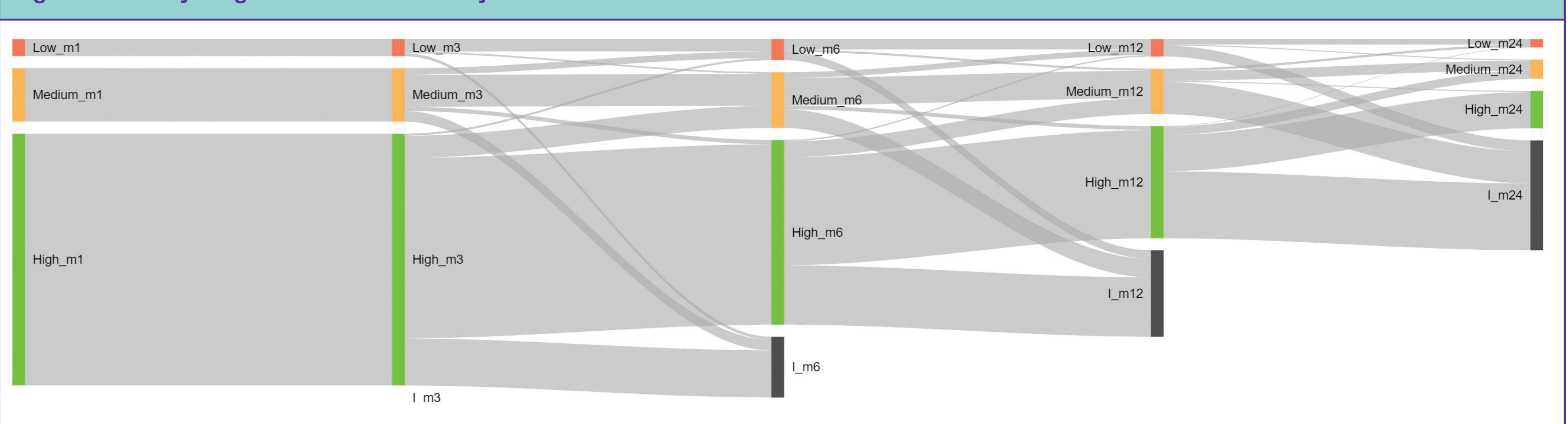
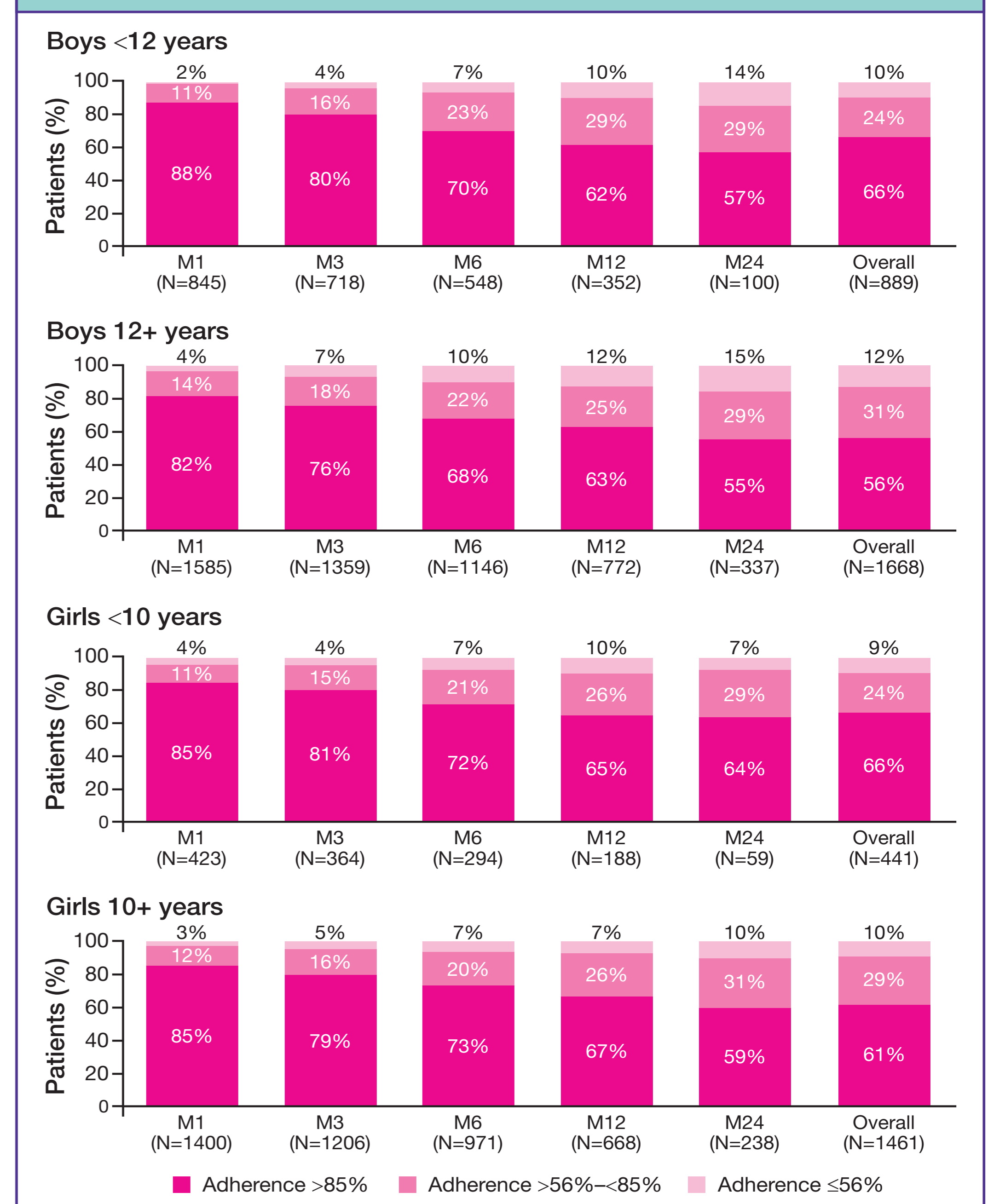


Figure 5. Adherence at Each Time Point Stratified by Nominal Puberty Age



Note: 'Overall' is defined as the total number of patients who received GH for which data are available.

CONCLUSIONS

- Two years of adherence data in LATAM patients using easypod connect are presented in this separate real-world sub-analysis
- Adherence declined over time, and factors such as nominal age of puberty appeared to affect adherence rates
- The groups of children who were most likely to transmit data were also more likely to have high or intermediate adherence
- Adherence and compliance in chronic treatments is still a challenge for Latin American countries;⁵ the easypod connect system helps patients and families to record and follow treatment progress
- Although real-world evidence suggested that high adherence was seen in all groups of children using easypod, further work is required to assess whether children/caregiver engagement via data transmission is associated with better long-term adherence and clinical outcomes
- Value of this data could be increased by integration with electronic health records, bringing the system closer to the clinical practice, and supporting adherence as part of integrated care

REFERENCES

- Cutfield et al. *PLoS ONE*. 2011;6:e16223.
- Bozzolo et al. *BMC Endocrine Disorders*. 2011;7:914.
- Koledova et al. *Endocrine Connections*. 2018;7:914.
- Cancela et al. Presented at ENDO. 2018;Abstract No. A-6968.
- Anauati et al. *Lat Am Econ Rev*. 2015, 24:11

DISCLOSURES

MR is an employee of EMD Serono Inc, USA, the biopharmaceutical business of Merck KGaA, Darmstadt, Germany. EK is an employee of Merck Healthcare KGaA, Darmstadt, Germany. VT is an employee of Ares Trading, an affiliate of Merck KGaA, Darmstadt, Germany

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