Adherence to growth hormone therapy: comparison of electronic auto-injection to non-electronic injection devices

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BACKGROUND

- Recombinant human growth hormone (r-hGH) is used to promote growth in children with conditions such as GH deficiency (GHD), Turner syndrome (TS), chronic renal failure (CRF) and to treat children born with postnatal age (SGA) who fail to demonstrate catch-up growth.1
- easypodTM is a hidden-needle auto-injector device that records the date and time of injection, prescribed dose (mg), injected dose (mg) and injection status (dose setting, performed, missed or partial injection). Due to the registration of each r-hGH injection, patient adherence can be monitored accurately.1
- We previously have reported that patients under r-hGH therapy using easypodTM as their electronic injection device showed a high adherence (AD) rate.1,2
- In addition we reported that patients using a non-electronic device (NEL) for r-hGH administration had a similar high AD rate to patients using the easypodTM electronic device.3

OBJECTIVES

- To evaluate AD rates of r-hGH treatment under everyday conditions and to calculate the amount of r-hGH administered using the easypodTM or a NEL device.
- To check the second possible reason, we compared the amount administered r-hGH via the electronic device easypodTM and the NEL device.

METHODS

- Retrospective, observational, open-label, non-controlled study in patients receiving r-hGH, either by the easypodTM or a NEL device.
- Patients were treated with r-hGH using either easypodTM or NEL devices.
- For patients using NEL devices, AD was determined by the ratio of provided vials to prescribed dose x duration of observation period (days)
- Data collection and calculation of adherence using the vial consuming method was performed by PAEDLOGIC software (www.paedlogic.com).

RESULTS

- In total, 250 patients (99 female, 151 male) received r-hGH using easypodTM. The observation period was 2.8 ± 2.3 years after start of GH therapy. The average age at the start of r-hGH therapy was 9.1 ± 3.6 years.
- In contrast, 294 patients (133 female, 161 male) using different NEL devices (needle injection or non-needle injection systems) were observed over a time period of 2.2 ± 1.2 years after start of GH therapy. The age of these patients at the start of r-hGH therapy was 11.3 ± 5.7 years.
- Modified analysis according to the criteria of Cutfield et al.4 indicated that there was a higher observed proportion of over-adherent NEL patients (AD ±10%) (Table 2). These results indicate that patients using the NEL device showed an over-AD due to wastage of r-hGH. This could be due to two reasons:
  - 1. Non-emptying of r-hGH vials or
  - 2. Storage mismanagement of the r-hGH vials.

CONCLUSIONS

- Both groups of patients using either NEL or easypodTM device show a similar high AD rate.
- Electronic measurement by easypodTM of AD has the advantage of direct detection of actual AD rate.
- Both groups also show an increased wastage of r-hGH although patients using easypod were younger and the sample size for this calculation was smaller than that for the patients using the NEL devices.
- Our results indicate that this is due to mismanagement of the r-hGH vials.
- To avoid wastage of r-hGH an electronic network should be established between pharmacy and patients for supporting management of r-hGH vials.
- Electronic connection from easyconnect-paediatic and Paedlogic software will be necessary to improve detection of wastage of r-hGH.
- Individual re-education of patients with low AD rate or insignificant wastage of r-hGH will be very important to adjust individual r-hGH dose for achieving optimal final height.

REFERENCES

4. Trendafilow M et al. Poster presented at the 9th Joint Meeting of Paediatric Endocrinology; September 2013; Milan, Italy [P2-41-I98]

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