Efficacy of a 4:1 dose ratio in patients switching botulinum toxin formulation from abobotulinumtoxinA to incobotulinumtoxinA

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Background

- The Walton Centre NHS Foundation Trust changed the ratio of the use of abobotulinumtoxinA (Dysport®, Ipsen Biopharm Ltd) to incobotulinumtoxinA (Xeomin®, Merz Pharmaceuticals GmbH) in 2013.
- Data published by other units state that a dose ratio of 4:1 is clinically equivalent in effectiveness and is also cost-effective.[1]

Objective

- This study was undertaken to establish if The Walton Centre NHS Foundation Trust found a 4:1 dose ratio to be effective and/or satisfactory when switching patients from abobotulinumtoxinA to incobotulinumtoxinA.

Methods

- The 3 years analyzed in the study are April 2012–March 2013 (prior to change), April 2013–March 2014 (year of change), and April 2014–March 2015 (following change).
- IncobotulinumtoxinA was used in The Walton Centre NHS Foundation Trust in 2012/2013 (prior to change), but more was used in later years.
- The average dose and dose ratio for each year was calculated for the five main conditions treated with abobotulinumtoxinA and incobotulinumtoxinA within The Walton Centre NHS Foundation Trust:
  - blepharospasm
  - other dystonia
  - hemifacial spasm
  - spasticity
  - cervical dystonia.
- The average dose ratio was calculated using the average dose used for patients treated within the time period analyzed.
- The average dose ratio is not based on individual patient doses following a switch from abobotulinumtoxinA and incobotulinumtoxinA.
- The largest patient group treated with botulinum toxin at The Walton Centre NHS Foundation Trust is patients with diagnosed cervical dystonia.
- Individual patient dose ratio was calculated for a sample of patients diagnosed with cervical dystonia who had switched from abobotulinumtoxinA to incobotulinumtoxinA.

Results

- **Table 1** shows the average dose ratio for the five main conditions treated in the 3 years analyzed.

Table 1. Average dose ratios

Diagnosis	2012/2013	2013/2014	2014/2015
Blepharospasm	3:1	3:1	3:1
Other dystonia	4:1	4:1	3:1
Hemifacial spasm	4:1	4:1	4:1
Spasticity	4:1	4:1	4:1
Cervical dystonia	4:1	4:1	4:1

Cervical dystonia patients

Individual dose ratio following a switch from abobotulinumtoxinA to incobotulinumtoxinA

- The majority (133/145; 92%) of patients switched from abobotulinumtoxinA to incobotulinumtoxinA using the recommended 4:1 ratio.
- Of these 133 patients, the 4:1 ratio remained adequate in the majority (111/133; 84%).
- One patient receiving treatment with a 2:1 ratio had originally switched using a 4:1 ratio. However, the dose was gradually increased over a number of injections, probably due to toxin resistance.
- One patient receiving treatment with a 5:1 ratio had reported ‘major benefit’ with both abobotulinumtoxinA and incobotulinumtoxinA.
- 43% of patients reported ‘major benefit’ or ‘moderate benefit’ with incobotulinumtoxinA. 45% of patients reported ‘major benefit’ or ‘moderate benefit’ with abobotulinumtoxinA.

Conclusions

- A switch at a ratio of 4:1 will succeed in most cases.
- Blepharospasm seems to need a ratio of 3:1 for reasons we cannot be sure of. A mixing/dispersion effect with low dose or volume is possible, but the effect was not seen in hemifacial spasm, which is essentially the same injection.
- In the largest patient group – cervical dystonia – most patients will successfully switch at a ratio of 4:1 and have a good response at that dose; a minority (<20%) will need an increase to a ratio of 3:1.
- Some patients (~25%) will switch back to abobotulinumtoxinA, possibly due to patient/operator preference.
- Based on internal pharmacy calculations in 2013, savings are made if >70% of patients are switched at either a ratio of 4:1 or 3:1. Here, the switch is long-lasting in ~75% of cases, and a 4:1 ratio is maintained in the majority.
- Smaller savings also apply at a ratio of 3:1, with this switch therefore appearing to have been cost-effective.

Reference

1. Grosset DG et al. J Rehabil Med 2015; 47: 183–186.

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