**Supplementary Table 1:** Detailed summary of the baseline characteristics including the clinical and kinematic results of each participant.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Clinical rating scores**  **TWSTRS** | | | **Tonic deviation** | | **Dynamic dystonia** | |
| **Participant ID** | **Treatment group** | **Sex** | **Age (years)** | **Part I** | **Part II** | **Part III** | **Number of DOFs affected** | **Mean severity (˚)** | **Number of DOFs affected** | **Mean severity (RMS˚)** |
| **1** | kb | F | 63 | 17 | 3 | 13 | 2 | 7.0 | 2 | 0.2 |
| **2** | cb | F | 61 | 14 | 12 | 10 | 0 | 4.7 | 0 | 0.06 |
| **3** | kb | F | 55 | 10 | 4 | 5 | 2 | 7.1 | 1 | 0.1 |
| **4** | cb | F | 69 | 19 | 5 | 13 | 3 | 10.8 | 0 | 0.08 |
| **5** | kb | F | 54 | 11 | 9 | 12 | 0 | 1.8 | 3 | 0.2 |
| **6** | cb | F | 44 | 14 | 3 | 3 | 0 | 1.0 | 2 | 0.1 |
| **7** | cb | F | 51 | 18 | 10 | 11 | 2 | 11.4 | 2 | 0.1 |
| **8** | kb | F | 53 | 23 | 18 | 13 | 2 | 37.2 | 3 | 0.3 |
| **9** | cb | F | 71 | 10 | 3 | 7 | 0 | 2.9 | 2 | 0.2 |
| **10** | cb | F | 62 | 12 | 14 | 13 | 0 | 2.3 | 2 | 0.4 |
| **11** | kb | F | 82 | 10 | 9 | 0 | 1 | 5.8 | 3 | 1.6 |
| **12** | kb | M | 56 | 13 | 18 | 17 | 1 | 5.3 | 2 | 0.1 |
| **13** | cb | F | 64 | 15 | 14 | 4 | 2 | 12.9 | 3 | 0.4 |
| **14** | kb | F | 74 | 5 | 4 | 5 | 0 | 1.2 | 3 | 0.2 |
| **15** | cb | F | 73 | 22 | 11 | 11 | 3 | 15.3 | 3 | 0.2 |
| **16** | kb | F | 55 | 16 | 18 | 12 | 2 | 17.6 | 3 | 0.3 |
| **17** | cb | F | 53 | 13 | 9 | 10 | 1 | 8.3 | 2 | 0.1 |
| **18** | kb | M | 60 | 22 | 13 | 17 | 3 | 12.2 | 1 | 0.2 |
| **19** | kb | F | 75 | 16 | 10 | 13 | 1 | 8.5 | 3 | 1.6 |
| **20** | kb | F | 60 | 27 | 16 | 15 | 3 | 26.4 | 3 | 0.3 |
| **21** | cb | M | 59 | 22 | 18 | 9 | 1 | 56.2 | 3 | 2.1 |

Abbreviations: cb: clinic-based treatment group; DOFs: degree of freedoms; F: female; kb: kinematic-based treatment group; M: male; part I: torticollis severity; part II: disability scale; part III: pain; RMS°: root mean square degrees; TWSTRS: Toronto Western Spasmodic Torticollis Rating Scale.