



COMPARISON BETWEEN A SESSION OF CLASSICAL AQUATIC THERAPY AND SPECIFIC ACCORDING TO THE HALLIWICK CONCEPT ON THE MODIFICATION OF SPASTICITY IN CHILDREN WITH CEREBRAL PALSY (CP)

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I. INTRODUCTION

- We start with the assumptions:
 - Warm water has an effect on spasticity
 - Halliwick therapy has a global effect on the *CP* child's body



- *The aim of our research was if two methods of aquatic therapy would yield differences in spasticity*



II. MATERIAL AND METHOD

II.1. Population

- * 10 quadriplegic spastic CP children (5 ♂ ; 5 ♀)
 - GMFCS IV and V
- * All registered at the Centre Arnaud Fraiteur
- * Aged between 5 and 12 years
- * 6 move in a electrical chair ; 4 are in a manual chair
- * All have a sufficient comprehension to understand simple orders

II. MATERIAL AND METHOD

II.2. Aquatic therapy

- * Swimmingpool with - a water between 30°-33°
- an ambient temperature of 27°
 - * Halliwick therapy consists of various rotation exercises (sagittal/transverse/longitudinal) given at a child without head control
 - * Classical therapy aims to control the child's head giving various sensations, on the back, without specifically rotations
 - * The sessions are « standardized »
 - * 20 minutes for one session
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II. MATERIAL AND METHOD

II.3. Assessment of spasticity

* Modified Tardieu scale --- > speed dependence

* Modified Ashworth scale --- > measure the resistance to passive movement



II. MATERIAL AND METHOD

II.4. Trial

- * Each child receives a Halliwick and a classical session (random)
 - * One or two weeks between each session
 - * Assessment of spasticity with the 2 scales
 - [1] --- > before therapy
 - [2] --- > after therapy,
 - [3] --- > after dressing
 - [4] --- > half an hour after dressing
 - * Elbow, Wrist, Knee and Ankle – side the more pathological – are tested
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II. MATERIAL AND METHOD

II.5. Statistics

- * The Interventions are done with the same person and must compare several variables simultaneously

The variables therefore are paired

- it is used the analysis of variance for repeated measures – anova
- * If anova is significant
 - Bonferroni test
- * Before anova
 - Kolmogorov-Smirnov to check the normal distribution



III. RESULTS

1* All values are reproducible (between the examiners)

2* Common values for the 4 muscular groups

--- > Ashworth : high statistical significant difference for the 3 times after the swimming session versus before in favour of Halliwick, especially for the wrist.

--- > Tardieu : same results but the difference is « only » highly significant

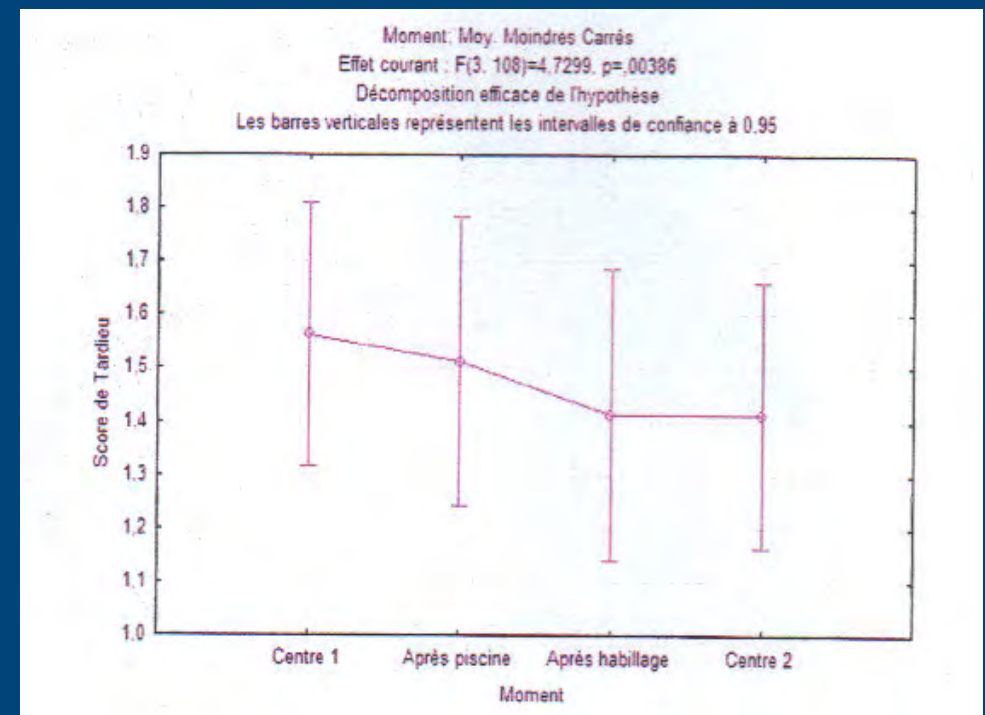
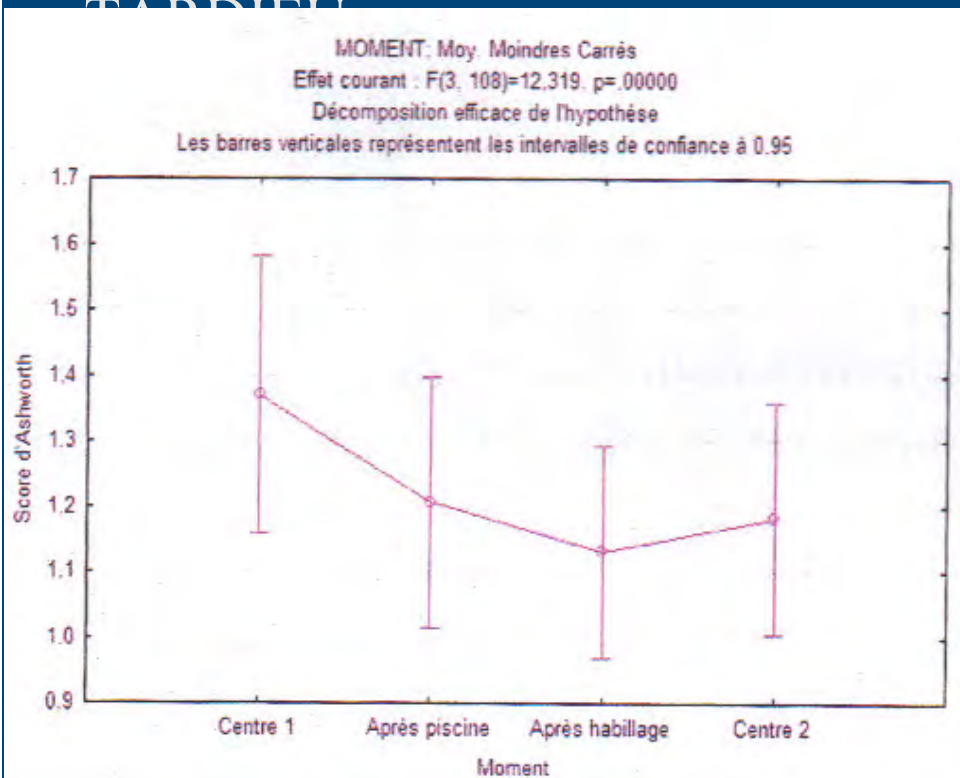
3* Analysis for each muscular group

--- > Ashworth AND Tardieu: significant to very high difference in favour “Halliwick”, specifically for the wrist and the Ankle.

III. RESULTS

ASHWORTH

TABLES

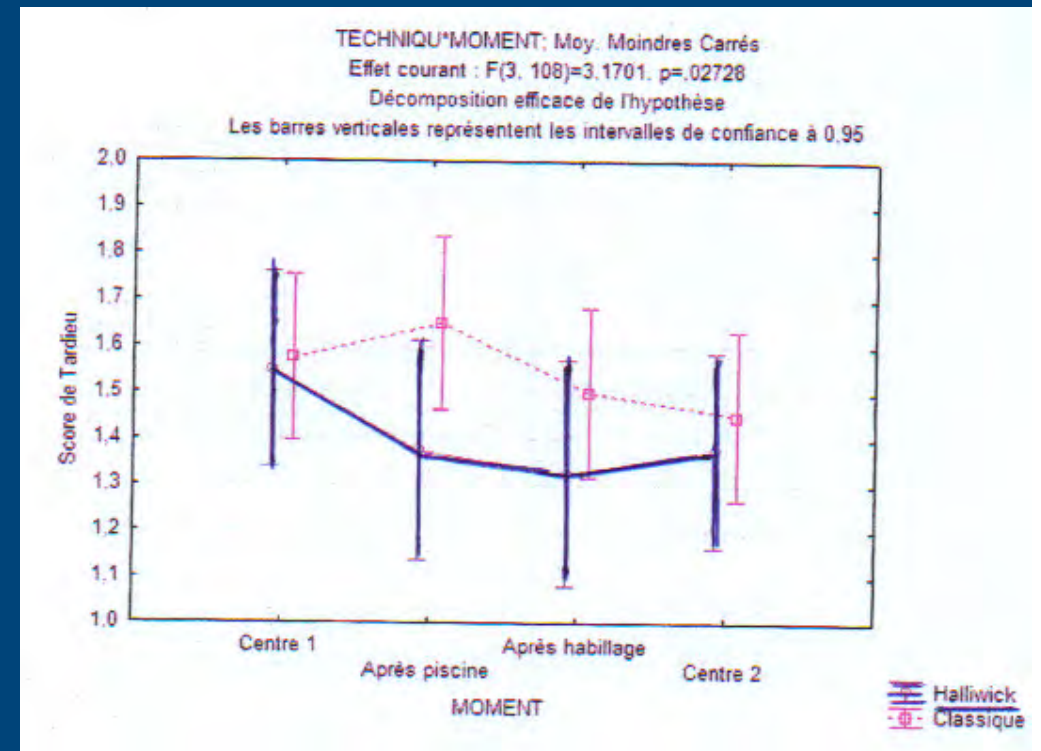
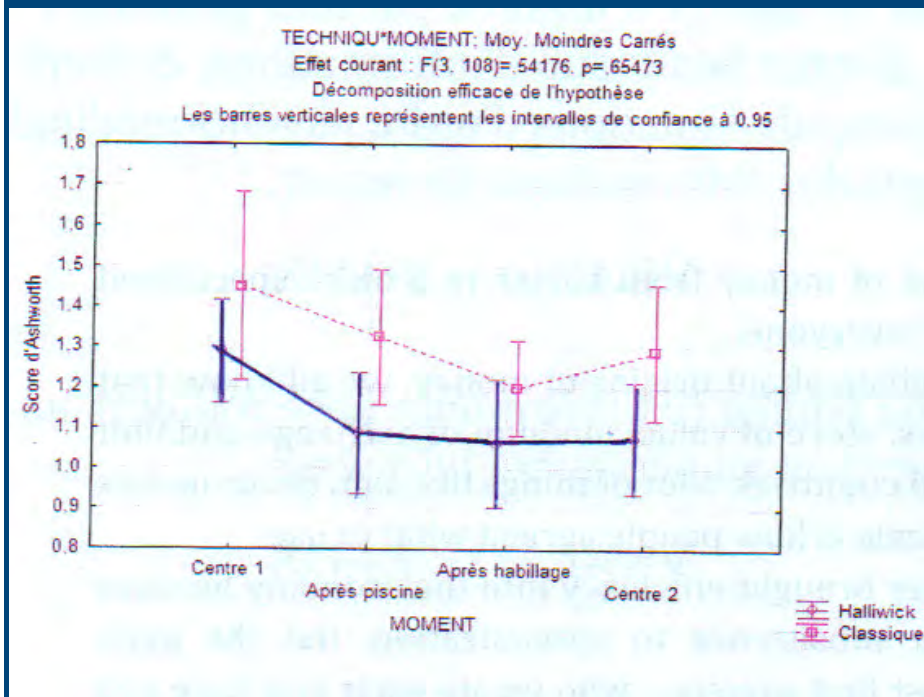


III. RESULTS

ASHWORTH

TABLES

TARDIEU



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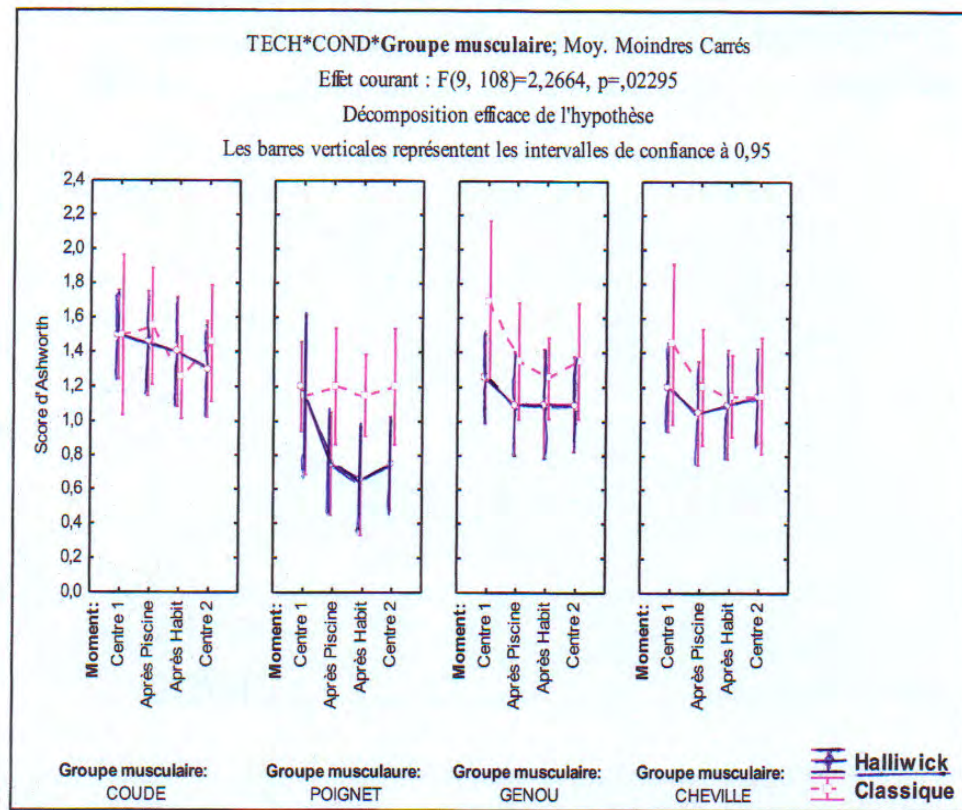
III. RESULTS

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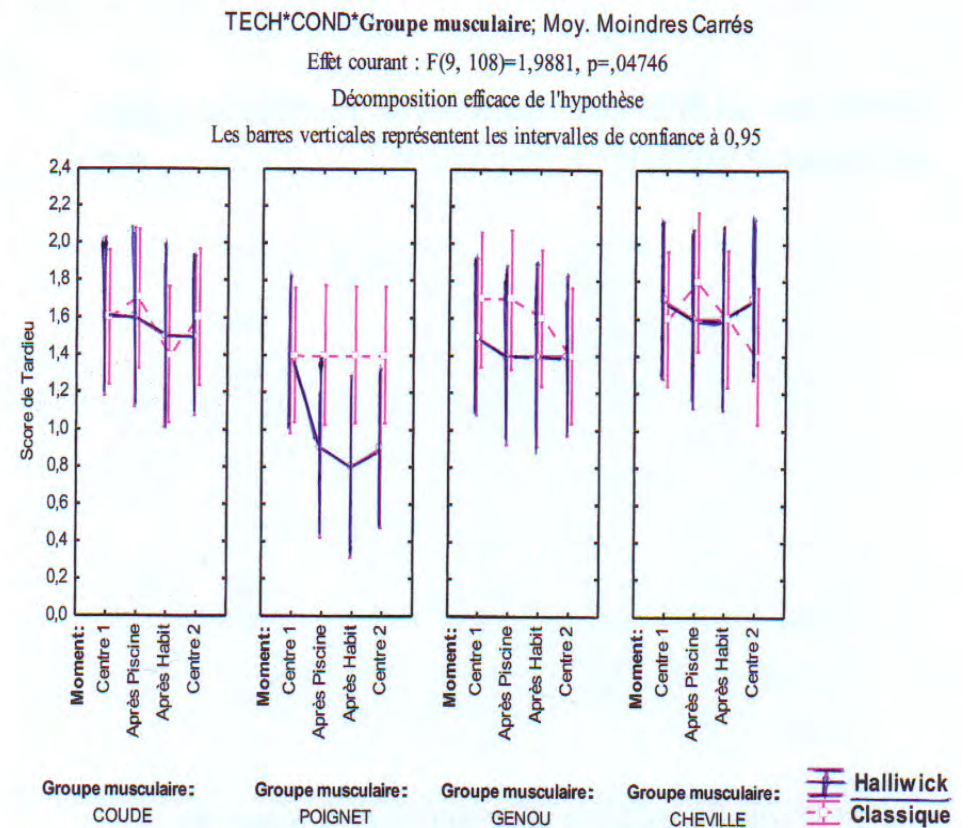
TABLES

TARDIEU

Graph.4 Effet de la technique, des moments, et du groupe musculaire pour le score d'Ashworth



Graph.7 Effet de la technique, du moment, et du groupe musculaire pour le score de Tardieu



IV. DISCUSSION

- *Spasticity decreases more after Halliwick than after classical session*
 - Mainly measureable in the wrist (and ankle) flexors[▲]
 - Probably due to the of active movement of the head combined with the rotation movements of the body
 - Effect less noticeable at the level of the legs.[▲]
 - The “activation” of the proximal muscles might be responsible for the relaxation of the tonus at a distance according to the muscular synergy theory (Coelho de Moraes et al, 2009), endorsed by “the Bobath philosophy” regarding spasticity (Graham & coll, 2009)
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V. CONCLUSION

In children with CP, HALLIWICK aquatic therapy shows
“significant”
results on the global decrease of spasticity lasting in time.

