Saturday, March 18, 2017

“Using initial physical assessment findings, is it possible to predict the age a child with Spina Bifida will commence independent walking: a retrospective chart audit”

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Using initial physical assessment findings, is it possible to predict the age a child with Spina Bifida will commence independent walking: a retrospective chart audit

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Aim

“To determine if the initial physical examination of the child within the first three months of life can predict when the child commences independent walking”
Method

Children presenting to CHW
2005-2015
Aged 0-12 months

Included
• Diagnosis of SB
• Lesion level L1 and below

Excluded
• Additional diagnosis or diagnosis other than SB
• Lesion >L1
• No initial data in first 3/12 of life
• No data on age of walking

Data collection
• Sociodemographic data
• Physical examination
  • Hydrocephalus +/- VP shunt
  • Developmental milestones
  • Walking aides

Statistical analysis
Stepwise multiple regression analysis
Method - stepwise multiple regression analysis

10 variables:
  - SB diagnosis
  - SB level of lesion
  - Congenital deformity of hip
  - Congenital deformity of knee
  - Congenital deformity of ankle
  - Hip extension power
  - Knee extension power
  - Ankle plantarflexion power
  - Presence of Hydrocephalus
  - VP-shunt
Results

62 children with SB

21 lipoMMC

L1-L2 1
L3-L4 5
L5 and below 15

VPS 0%
Contractures 33%

5 MC

L1-L2 0
L3-L4 0
L5 and below 5

VPS 0%
Contractures 40%

36 MMC

L1-L2 13
L3-L4 4
L5 and below 19

L1-L2 VPS 92%
Contractures 84%

L3-L4 VPS 50%
Contractures 100%

L5 and below VPS 63%
Contractures 63%
Results
Results

Age = 27.8 – (3.3 x ankle plantarflexion) + (7.4 x VP shunt) - (4.7 x hip extension)

71% variance, F = 37.4, p < 0.0001
Results – high lumbar lesion

27.8 – (3.3 x ankle plantarflexion)  
+ (7.4 x VP shunt)  
– (4.7 x hip extension)

High lumbar lesion
Ankle plantar flexion 0/2  
VP shunt 1  
Hip extension 0/2

27.8 – (3.3 x 0) + (7.4 x 1) - (4.7 x 0) =  
27.8 - 0 + 7.4 - 0 = 35.2 months (2 y 11 months)
Results – sacral lesion

27.8 – (3.3 x ankle plantarflexion) + (7.4 x VP shunt) – (4.7 x hip extension)

Sacral lesion

Ankle plantar flexion 2/2
VP shunt 0
Hip extension 2/2

27.8 – (3.3 x 2) + (7.4 x 0) - (4.7 x 2) = 27.8 – 6.6 + 0 – 9.4 = 11.8 months
Discussion

Able to predict over 70% variance at initial assessment

- Ankle plantarflexion – hip extension – VP shunting
- Lower limb congenital musculoskeletal complications

Able to predict mobility at all lumbar lesion levels

First to assess and predict within the first 3 months of life
Limitations

- Retrospective chart audit
- Small sample size
- Only applicable to SB without other diagnosis
- Does not consider future variables
Clinical Implications & Future Research

- Timely referral to early intervention
- Prospective
- Larger sample size
- Development of standardised assessment


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