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Age and Functional Outcomes Post-Neurologic Insult in Patients Attending Inpatient Rehabilitation

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Background and Purpose

- Stroke and traumatic brain injury (TBI) affect over 1 million Americans annually
- Challenges related to accurate prognoses post-stroke or -TBI are a focus of much research
- This project aimed to determine whether age at time of insult could predict improvement of functional outcomes during stay at an inpatient rehabilitation facility (IRF)

Methods

- Twenty subjects were included the analysis (Table 1)
  - Stroke n=16 (7 female)
  - TBI n=4 (0 female)
  - Mean age 66.5 years (range: 27-82 years)
- Functional Independence Measure (FIM) scores were recorded near admission and discharge from the IRF to assess motor and cognitive function (higher scores indicate greater function)

Table 1. Subject Characteristics and Scores on Functional Measures (N=20)

Characteristic or Measure		Mean (SD)
Age (years)		66.5 (18.0)
Days since stroke/TBI		20.4 (8.6)
Length of stay (days)		9.1 (4.4)
Motor FIM (max 91):	Admission	30.7 (13.8)
	Discharge	58.2 (18.1)
Motor MRFS		0.4 (0.2)
Cognitive FIM (max 35):	Admission	20.6 (6.0)
	Discharge	28.7 (5.0)
Cognitive MRFS		0.5 (0.3)

Statistics

- The Montebello Rehabilitation Factor Score (MRFS)[1] was calculated by using admission and discharge FIM scores to assess improvement in motor and cognitive function

$$\text{MRFS} = 100 * \frac{(discharge\ FIM - \ admit\ FIM)}{(max\ possible\ FIM - \ admit\ FIM)}$$

- Simple linear regression was used to determine whether patient age predicted improvements in cognitive or motor function, as assessed by MRFS
- Descriptive statistics and simple linear regression were conducted using SPSS version 24.0

Results

- The regression model was statistically significant, in which younger patients showed greater improvements in MRFS motor function during IRF stay (Figure 1) ($F=25.01$, $p<0.001$, $\beta=-0.76$, $R^2=0.58$)
  - There was no correlation between age and baseline motor function, as assessed by admission motor FIM ($p=0.33$)

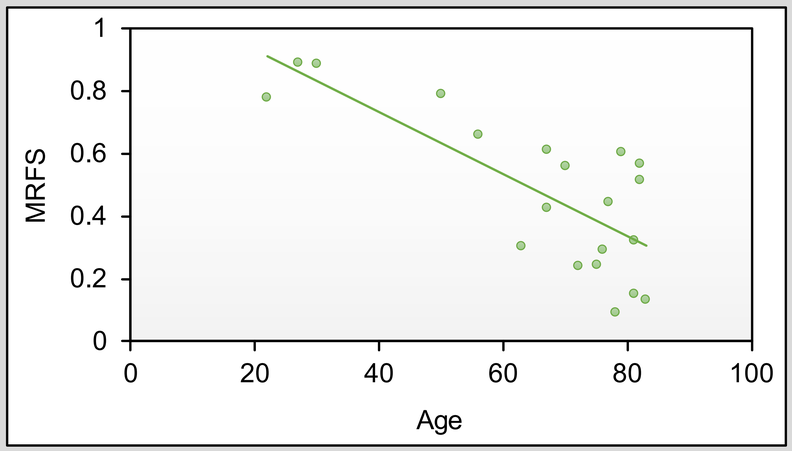

Figure 1. Motor Montebello Rehabilitation Factor Score (MRFS) as a function of age.

- There was also a trend towards significance in which younger patients showed greater MRFS cognitive improvements ($F=3.71$, $p=0.07$, $\beta=-0.41$, $R^2=0.17$)
  - Younger patients tended to have poorer baseline cognitive function, as assessed by admission cognitive FIM ($p=0.03$)

Discussion

- Findings suggest that age at the time of neurologic insult can predict relative improvement in motor outcomes in a sample of patients attending an IRF
- Our results are consistent with previous work and extend findings to patients post-acute stroke or -TBI attending an IRF[2-5]
- Though patient age was not associated with baseline motor function, younger patients tended to have poorer baseline cognitive function; thus, the trend toward significance in predicting relative improvement in cognitive function may be attributed, in part, to greater opportunities for enhancement available
- Mechanisms that contribute to the relationship between younger age and improved relative motor recovery may be associated with greater neuroplasticity, motivation, cognitive engagement, physical activity, or other factors[4,5]
- More research with larger samples is needed to identify mechanisms associated with this relationship

References

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