

Neurodevelopmental Outcome of Pediatric Kidney Transplant Recipients

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Background

- In school-aged children cognitive performance in the low average to average range have been noted (Falger et al, 2008; Fennel et al, 1984; Lawry et al, 1994; Qvist et al, 2002)
- Falger et al (2008) noted specific neurocognitive impairment in
 - Motor performance (Falger, 2008)
 - Performance IQ (Falger, 2008)

- We wanted to evaluate the effects of chronic kidney disease and consequent kidney transplantation on both general cognitive level and specific neurocognitive areas among children.

Methods

- Inclusion criteria:
 - Kidney or kidney-liver transplantation at the Helsinki University Central Hospital at least 1 year prior to assessment
 - 6.0-16.5 years of age
 - Finnish or Swedish as first language
- N = 49 (21 girls and 28 boys)
- A control group was chosen from the NEPSY-II standardization sample

Measures

- Wechsler Intelligence Scale for Children – Third Edition (Wechsler, 1999)
- NEPSY – II (Korkman, Kirk & Kemp, 2008)

Background Characteristics

- The kidney transplanted children were assessed on average 6.9 years postoperatively (SD = 3.7; range 1.0-14.1 years). Mean age at the time of assessment was 11.2 years (SD = 3.2; range 6.3-16.4 years).
- Mean age for the control group was 11.1 years (SD = 3.0; range 6.2-15.3 years).

Results

	M (<i>SD</i>)	<i>t</i>	<i>p</i>
Verbal IQ	87.2 (21.6)	-4.1	<.001
Performance IQ	80.0 (23.1)	-6.0	<.001
Full-Scale IQ	83.2 (19.4)	-6.0	<.001

IQ has a mean of 100 ($SD = 15$) in the normal population.

Table 1. Mean (*M*) Intelligent Quotients and Standard Deviations (*SD*) of the Kidney Transplanted Children in the Wechsler Intelligence Scale for Children Compared to Test Norms ($n = 48$)

Full-Scale IQ	<i>N</i> (%)
< 70	9 (19)
70-84	13 (27)
85-115	26 (54)
> 115	0 (0)

Table 2. Distributions of IQ values in the Kidney Transplants Recipients (n = 44) in the Wechsler Intelligence Scale for Children.

Neurocognitive Test Profile

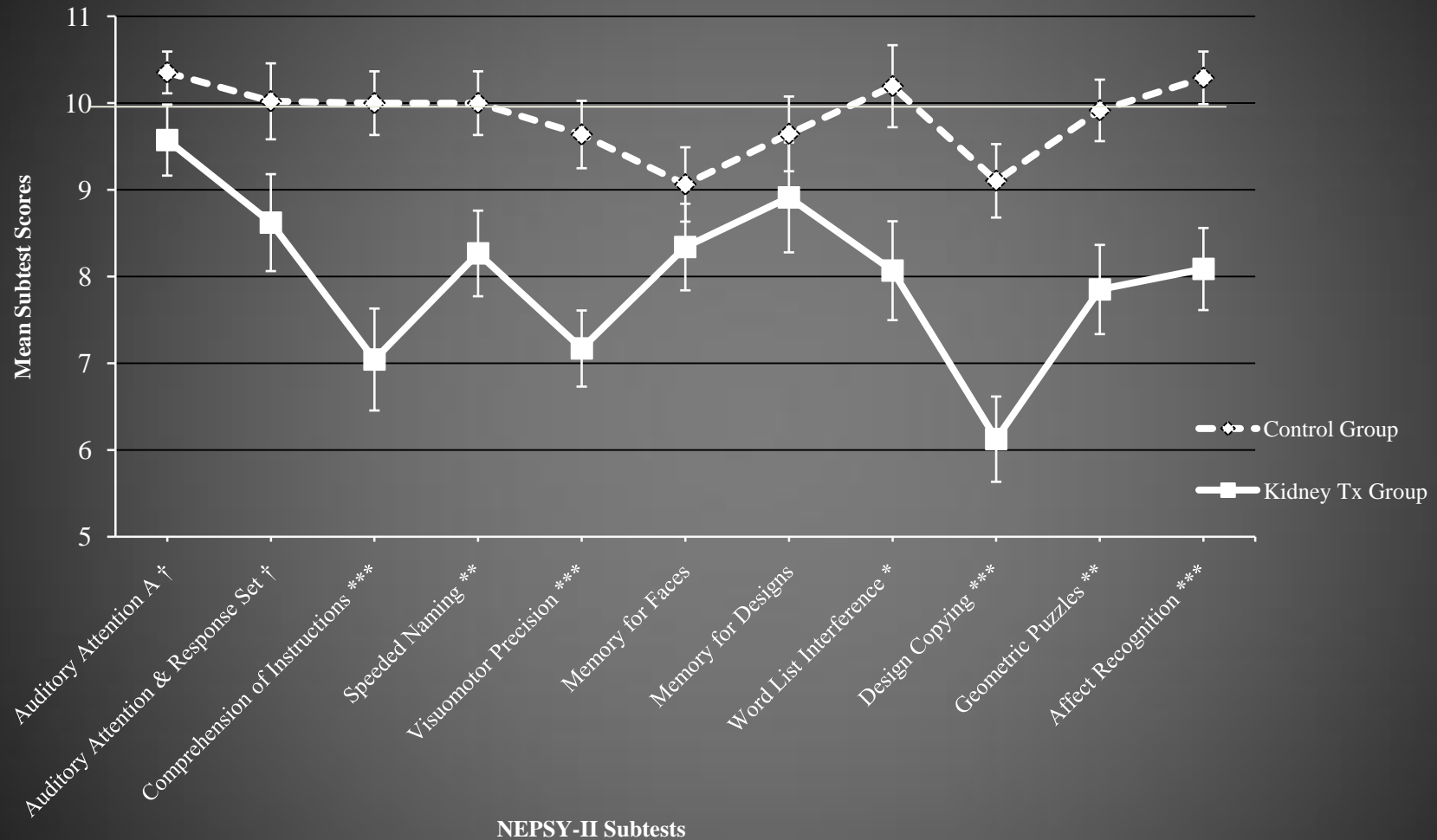


Figure 1. Profiles of mean subtest scores and error bars of the mean in NEPSY-II for the kidney transplanted children (Kidney Tx Group) and the control group. The horizontal line indicates the mean 10 ($SD = 3$; range 1-19) in the normal population.

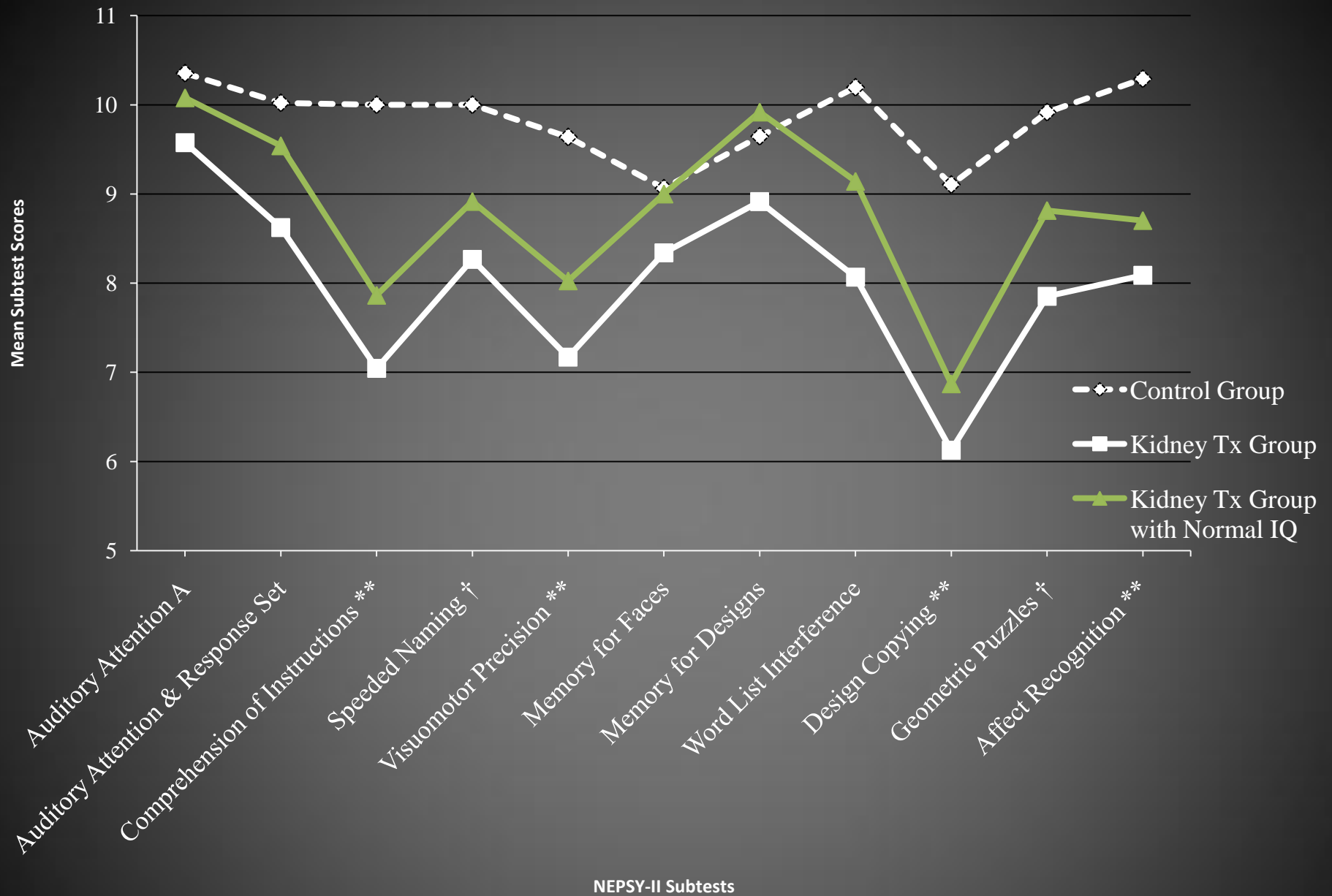


Figure 2. Profiles of mean subtest scores in NEPSY-II for the kidney transplanted children (Kidney Tx Group), kidney transplanted children with FSIQ>70, and the control group.

Discussion

- Mean global intelligence in the borderline range.
- Impaired performance in visuomotor and visuoconstructive skills, social perception, and language.
- Even with an adequate cognitive level, there may be risk for impairment in these neurocognitive areas.

Conclusions

- Individual neuropsychological evaluation is recommended so that educational needs can be addressed.