

Introduction

Physical activity is central to the biological and psychosocial development of children and their overall childhood health. There is evidence that the risk of a sedentary lifestyle in adulthood is tripled by motor skill delays and inactive childhoods. Older children and adults with congenital heart defects (CHD) are found to have hypoactive lifestyles compared to their peers. This more sedentary lifestyle puts them at a higher risk for morbidities in adulthood such as diabetes, heart disease, and obesity. The current literature addresses issues related to sedentary lifestyles associated with CHD in older children and adults, but no data is available for children under four years of age, or children with milder CHD. With the emerging evidence of the impact of sedentary lifestyles on later life, it is extremely important to identify and enable age-appropriate motor skills and physically active lives among children with CHD. This study aims to determine which young children with CHD are less active, when their activity levels decline, and when and how their motor skills are delayed.

Methods

Participants: Children aged 1-3 were recruited in the cardiology clinic at the Children's Hospital of Eastern Ontario, in Ottawa, and were categorized within 5 CHD patient groups: 0-innocent heart murmur, 1-CHD not requiring intervention, 2-CHD requiring non-surgical repair, 3-CHD requiring surgical repair but no bypass, 4-CHD repair with cardiopulmonary bypass. A total of 46 females and 56 males were tested (n=102), with a mean age of 29.45 months.

Procedure: The Peabody Motor Skills version 2 test will assess motor skill abilities of the participants every 8 months for 2 years. This preliminary analysis represents findings from the first assessment. By comparing the scores of the assessments between CHD patient groups, we will be able to determine which group is at the highest risk for motor skill delay, the age at which they are most susceptible, and the area of motor skill in which they are lacking.

Analysis: SPSS software was used to generate univariate analysis of variance between the variables gender, age, and study group on total motor quotient, fine motor quotient, and gross motor quotient. Secondly, one-sample t-tests were used to compare study group populations to their unaffected counterparts.

Results

Figure 1: The effect of CHD group categorization on total motor quotient (TMQ), gross motor quotient (GMQ), and fine motor quotient (FMQ).

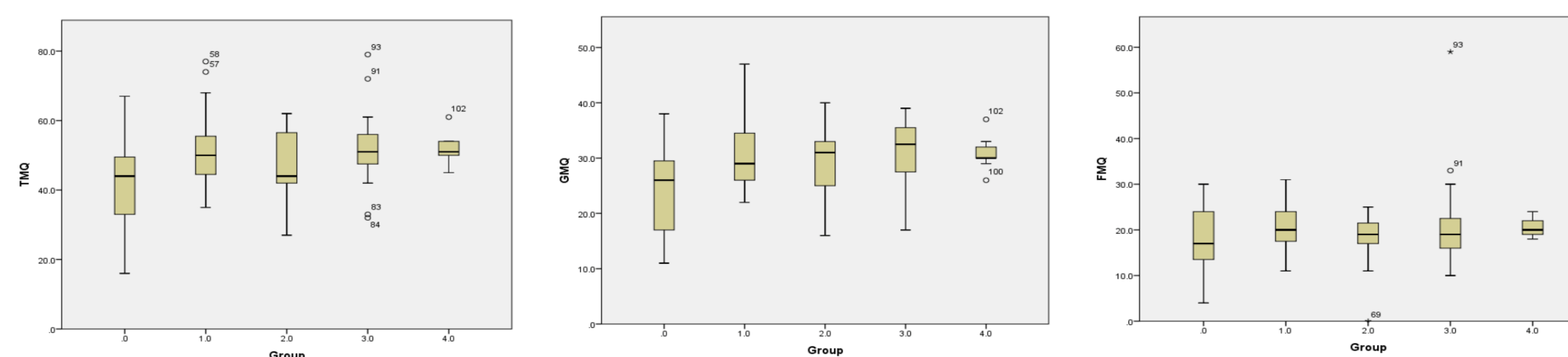


Figure 2: T-test showing comparison of TMQ, GMQ, and FMQ scores of children with CHD to the healthy population.

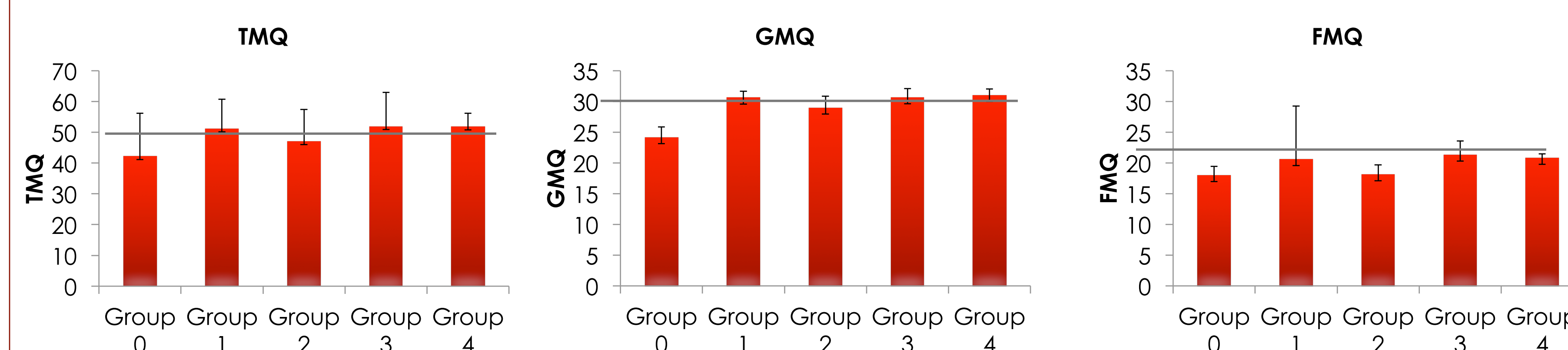


Table 1: Significance of age on the total motor quotient (TMQ), gross motor quotient (GMQ), and fine motor quotient (FMQ) of children with congenital heart defects.

	Parameter	Beta	Std. Error	Lower 95% C.I.	Upper 95% C.I.	Significance
TMQ	Age	-0.219	0.0993	-0.24	4.862	0.027
	Intercept	48.704	3.6979	41.457	55.952	0.000
	Group 4	8.086	4.1385	-0.25	16.197	0.051
	Group 3	9.667	3.1687	3.456	15.877	0.002
	Group 2	3.741	3.4797	-3.079	10.561	0.282
	Group 1	9.678	2.7956	4.199	15.157	0.001
	Group 0	0 ^a	.	.	.	.
FMQ	Age	-0.112	0.0634	-0.237	0.012	0.076
	Intercept	21.352	2.3606	16.726	25.979	0.000
	Group 4	1.998	2.6419	-3.180	7.176	0.450
	Group 3	3.268	2.0228	-0.696	7.233	0.106
	Group 2	-0.491	2.2213	-4.845	3.862	0.825
	Group 1	2.934	1.7846	-0.564	6.432	0.100
	Group 0	0 ^a	.	.	.	.
GMQ	Age	-0.107	0.0620	-0.228	-0.15	0.086
	Intercept	27.352	2.3088	22.827	31.877	0.000
	Group 4	6.088	2.5840	1.024	11.153	0.018
	Group 3	6.398	1.9784	2.521	10.276	0.001
	Group 2	4.232	2.1726	-0.026	8.491	0.051
	Group 1	6.744	1.7455	3.323	10.165	0.000
	Group 0	0 ^a	.	.	.	.

Conclusions

- Group classification was found to significantly affect overall TMQ scores (GMQ+FMQ).
- Group classification affected GMQ but not FMQ.
- Group 0 (innocent heart murmurs) was the only group with significantly lower TMQ and GMQ scores when compared to the unaffected population.
- Age affected TMQ and GMQ scores, but not FMQ scores. This means as the children get older, their TMQ and GMQ scores are getting more delayed with respect to their peers.

Future Outlooks

- The next steps in this study are to complete the following three rounds of analysis.
- Once the full analysis is complete (4 visits in total), areas where intervention is necessary will be identifiable.

Acknowledgments

A big thank you to UROP for providing me with this opportunity and to Dr. Patricia Longmuir for the guidance and supervision.

Thank you to research assistants Ms. Audrey Prayal-Brown and Ms. Priscilla Belanger for assistance with the data collection.

This work was supported by a Grant-in-the-Aid from the Heart and Stroke Foundation of Canada



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