



Is swimming helpful or harmful in adolescents with idiopathic scoliosis?

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Introduction. Sports activities seem to play a protective role on idiopathic scoliosis progression in adolescent. However, some studies showed a higher prevalence of trunk asymmetries in competitive swimming athletes.

Aim. To verify the safety of amateur and competitive level swimming in adolescents with IS.

Methods. Design. Retrospective observational cohort controlled study embedded in a prospective clinical data collection started in 2003 in a specialized institute focused to conservative treatment of spine disease. **Participants.** All consecutive patients age ≥ 10 , juvenile or adolescent IS diagnosis, Risser 0–2, with scoliosis specific exercises prescription and no brace prescription. **Outcome measures.** Change in Cobb degrees and increase ≥ 5 Cobb degrees at 12 months follow-up x-rays. **Exposure.** Swimming. **Statistics.** Propensity scores were used to reduce the potential effects of confounders related to the observational design. A multiple linear regression and a binary logistic model with covariate adjustment (baseline age, sex, risser, Cobb degrees, ATR, BMI) were run to compare the effect of swimming to other sports activities, and competitive to amateur swimming. Crude coefficient and OR guided the choice of covariates to be included into the multivariate analysis.

Results. Of 780 patients fulfilling inclusion criteria, 529 (68%, 420 females, age 12.3 ± 1.3 , 16.0 ± 3.6 Cobb degrees) regularly performed regular sports activities. 63 (12%) were swimmers, and 15 were engaged in swimming competitions.

Propensity scores showed there was no interaction between the covariates and the log odds of swimming and being a competitive swimmer. Among the variables included into the multivariate analysis, only ATR and age significantly affected both outcomes. No significant differences were found between swimming and performing other sports activities and between competitive and amateur level swimming in both outcomes. Comparing swimmers to patients performing other sports, progression of 5 degrees or more is 12% more likely as the ATR increases and 22% less likely as age increases, as shown in the table with the crude and adjusted OR.

Progression >5 Cobb degrees	Crude OR (95% CI)	p value	Adjusted OR (95% CI)	p value
Swimming	1.44 (0.77-2.69)	0.25	1.49(0.79-2.83)	0.21
ATR	1.12(1.03-1.22)	0.008	1.14(1.04-1.25)	0.002
AGE	0.78(0.66-0.93)	0.007	0.75(0.63-0.90)	0.002

Crude and adjusted OR for the progression of 5 Cobb degrees comparing swimming and other sports activities.

DISCUSSION and CONCLUSION

In this sample of IS adolescents, the effect of swimming is similar to other sports activities. Competitive swimmers showed the same risk of progression of amateur level swimmers. These results should be checked in a larger sample of athletes.