

## Sport activity reduces the risk of progression and bracing: an observational study of 511 JIS and AIS Risser 0-2 adolescents

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**Introduction:** Many Italian adolescents are engaged in extra-school sporting activities (SPORT) since Italian school provides only 2 weekly hours of sport activity to every student. Despite many studies regarding idiopathic scoliosis treatment, little objective information is available to determine if the participation of Juvenile (JIS) and Adolescent Idiopathic Scoliosis (AIS) subjects to SPORT is recommended.

**Objectives:** To assess the effect of SPORT on a large population of JIS and AIS adolescents.

**Methods:** Design: retrospective observational cohort study. Participants: all the subjects visited in ISICO between 2003 and October 2017, who presented at  $\geq 10$  years of age with an x-ray showing a Cobb angle between  $10^\circ$  and  $25^\circ$ , Risser 0-2, diagnosis of JIS or AIS and no brace prescription. Outcome measures: At 12 months follow-up x-ray, an increase of scoliosis curve  $\geq 5^\circ$  Cobb was considered as progression and an increase to  $\geq 25^\circ$  Cobb – need of brace – was considered as failure. Statistics: Relative risk (RR) was calculated to compare the outcome of subjects performing and not-performing SPORT. A logistic regression with covariate adjustment was run to assess if frequency has an effect on the outcome measures.

**Results:** 511 subjects (mean age  $11.9 \pm 1.2$ , 415 females) were included. 318 regularly performed SPORT. Subjects not performing SPORT showed a higher risk of progression (RR=1.57 CI95% 1.16-2.12 P=0.004) and of failure (RR=1.85 CI95% 1.19-2.86 P=0.007) than subjects performing SPORT. Logistic regression confirmed that the more frequent the SPORT, the less probable progression (P=0.0004) and failure (P=0.004). As the sport's frequency increases one day per week, the risk of progression decreases of 0.1 (CI95% 0.05-0.15 P=0.000) while the risk of failure decreases of 0.06 (CI95% 0.02-0.09 P=0.001). Subjects engaged in high-level agonism (at least 2 hours of daily training  $\geq 5$  times a week) were too few to be compared to other groups.

**Conclusions:** This study shows that SPORT is useful to protect against scoliosis progression at 12 months follow-up in JIS and AIS and it should be added to classical treatments. The more frequent the SPORT, the less the risk of progression and failure appears.