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What do we really know about natural history of idiopathic scoliosis during growth? Results of a systematic review

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Introduction

The real risk of progression of idiopathic scoliosis is considered to vary during different growing phases, but we don't have solid knowledge. Some old papers rate have been for years considered the most relevant description of progression risk of scoliosis during growth, but more recent data suggest the natural history to be even more aggressive. To our knowledge there is no systematic review in this field.

The aim of this study is to provide a systematic review of current literature about natural history of scoliosis during growth in order to provide details about the risk of progression.

Methods

We perform a systematic review of papers describing the natural history of IS during growth and its progression during growth. We searched the MEDLINE, EMBASE and SCOPUS databases up to November 2015. We also screened reference lists of the eligible studies and narrative reviews. Eligible studies were prospective or retrospective studies that enrolled patients with infantile (IIS), juvenile (JIS) or adolescent idiopathic scoliosis (AIS) followed up without any treatment from the time of detection. We used standard methodological procedures expected by guidelines for systematic reviews.

Results and discussion

From the 1663 citations screened, we assessed 61 full-text articles and included 16 of these (4083 participants) (Fig 1 and Table 1). Due to relevant differences among the studies, it was not possible to perform a meta-analysis. Taking separately into account studies regarding the infantile, the juvenile and the adolescent IS, we could find that they are heterogeneous with regards to the most of study characteristics and outcomes. Forty-eight percent of patients affected by IIS showed progression (range 5-80%) while 52% had spontaneous resolution. A curve progression $> 5^\circ$ Cobb was noticed in 33% in a mixed group of patients affected by JIS or AIS (range 14,7-68%). Twenty-eight percent of patients affected by AIS had a progression of $> 5^\circ$ (range 10,3-100%). Fifty-two percent of patients from one study had a progression and concluded growth with more than 50° (Table 2). Some authors reported the rapidity rate of scoliosis progression, which ranged from 2.2° to 9.6° Cobb per year. The most of the studies have shown to have confounding

factors related to some kind of conservative treatment administered at some point of the follow up period, so a lot of patients were not unconditionally followed until skeletal maturity.

Conclusion

Just a few studies represent the real natural history of scoliosis without any confounding factors. The definition of progression varied, and data outcome described differed, preventing from a meta-analysis. What was clear from almost all the studies is the risk of progression of the Cobb angle during growth, even if the rate of scoliosis progression is extremely variable among studies. This heterogeneity has implication in fields of clinical practice and research.

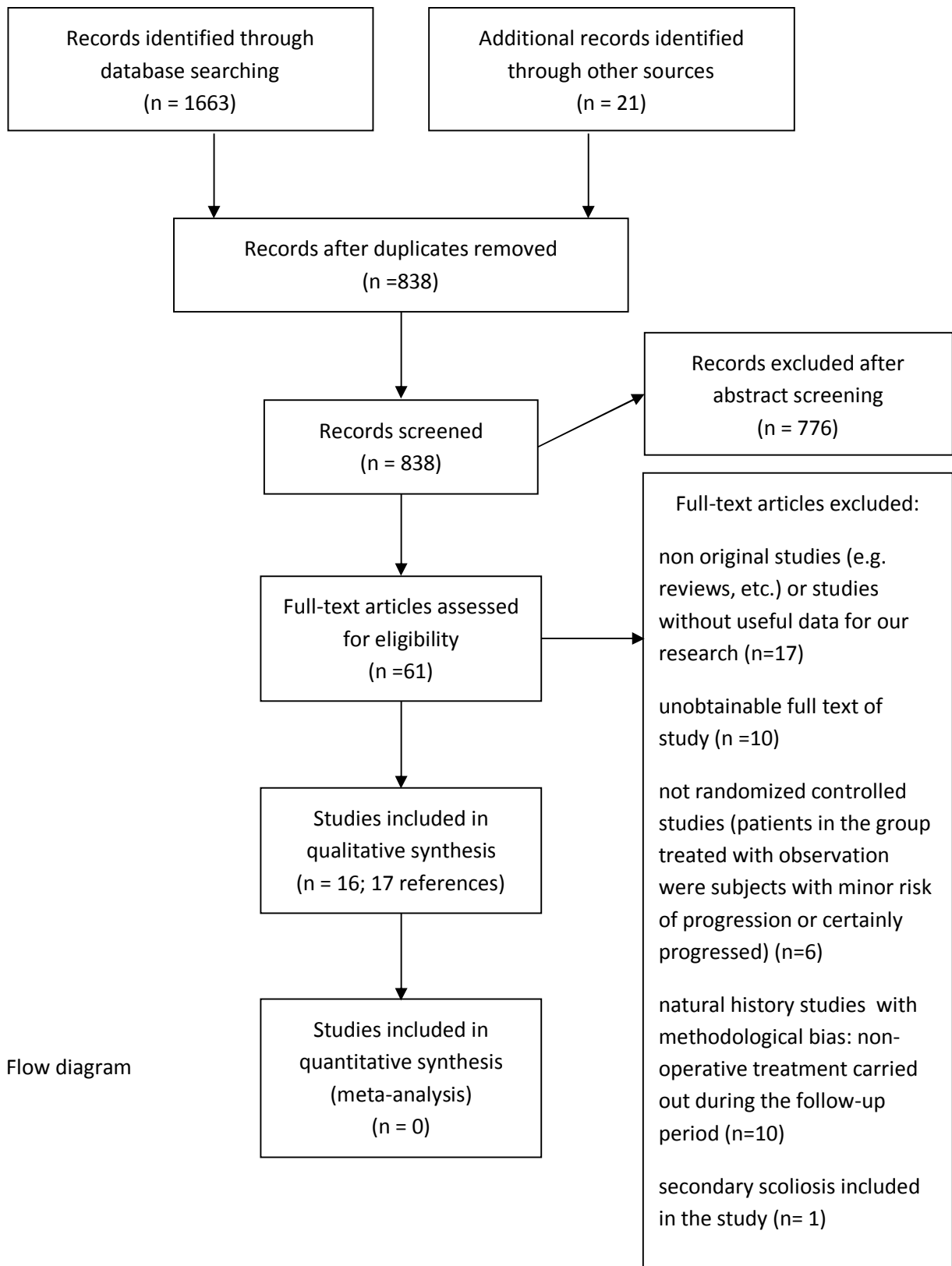


Fig. 1 Flow diagram