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NORMATIVE DATA FOR RADIOGRAPHIC SAGITTAL PARAMETERS IN ASYMPTOMATIC POPULATION FROM CHILDHOOD TO ADULTHOOD: A SYSTEMATIC SEARCH AND REVIEW

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Introduction

The sagittal morphology and balance of the spine are crucial for the overall functioning of the trunk. While they are strictly linked to the risk of developing pain and, thus, disability in adulthood, they are also relevant to eventual treatments during growth. Sagittal structural alterations are present in pathological growth conditions such as scoliosis, hyperkyphosis, and junctional kyphosis and may gradually progress in adulthood. Currently, there are no defined shared normative values for the radiographic main parameters in the general population during growth (in the absence of pathological or degenerative alterations), required for a better clinical and scientific classification of the patient.

Objective (s)

The current study aims to collect reference values for radiographic sagittal measures in general population aged 0-40.

Study Design

Systematic search and review.

Methods

We conducted a systematic search of the literature published in English until July 2022 on Medline, EMBASE, CINAHL and Scopus, including all the primary studies (such as RCTs, prospective and retrospective studies, case series, and single-case studies) that reported measures of sagittal radiographic parameters in general (normal) population aged between 0-40. The frequencies of the sagittal parameters and their values have been summarized through narrative synthesis and tables.

Results

We identified 8881 articles and included 36 observational studies, considering 5006 participants, with ages ranging from 3 to 40 years. The most frequently reported measures were thoracic kyphosis (TK),

lumbar lordosis (LL), cervical lordosis (CL), pelvic tilt (PT), pelvic incidence (PI), sacral slope (SS) and sagittal vertical axis (SVA). We found a mean TK of 41.8±9.5 (18 studies), LL of 49.9±10.1 (17 studies), CL of 4.2±10 (5 studies), PT of 10.3±7.3 (24 studies), PI of 48.7±10.4 (24 studies), SS of 38.8±7.8 (20 studies) and 9.7±25.8 (17 studies). All parameters increased with age but at a different rate, reaching the adult norm at different ages.

Conclusion and significance

Normative data from the general population can be useful for clinicians to classify patients with spine sagittal alterations and better personalize the interventions. In clinical practice, it is important to know the reference values by age to propose appropriate treatments. Even though there is a lot of research in the field, data during growth are still scarce and the current evidence does not allow a complete synthesis of the data, due to a significant heterogeneity in the studied population and reporting.