Abstract

There is increasing evidence that non-specific low back pain (LBP) is common among children and adolescents, but there are few longitudinal studies on this subject. This is a longitudinal prospective study aimed at finding factors associated with the prediction of low back pain in schoolchildren aged 9–12 years, which is a younger age group than has previously been studied. This study was performed on school children in the city of Antwerp, Belgium. A total of 287 children filled out a questionnaire and were examined at the beginning of the study (T1) and 2 years later (T2). The questionnaire asked about back pain, general health, health perceptions, quality of life perceptions, sports, leisure, daily life, school life (weight of satchel...) and some issues related to parents (smoking, LBP). The questionnaire reliability was tested. Logistic regression was used to analyse the data. No predictors for LBP in children could be identified. Using logistic regression techniques, we analysed the children who reported no lifetime episode of LBP at both T1 and T2, the children who did report a lifetime episode at both T1 and T2 and also those who reported a history of LBP at T2 only (New LBP). At T2 there were 51 children (17.8%) reporting suffering at least one lifetime episode of LBP who had not reported such an episode at T1. Only one parameter showed a statistical difference: New LBP was observed significantly more frequently in children who do not walk to school ($P<0.0001$). An interesting point of this study is that a number of children who had reported a history of LBP at T1 did not do so at T2. It may be that LBP in children is so benign and its natural history so favourable that the memory of the episode fades away. It is extremely interesting to note that among the few significant variables, those related to general well-being and self-perception of health, are prominent.

It appears, therefore, that psychological factors play a role in the experience of LBP in a similar way to what has been reported in adults. Poor self-perception of health (health belief) could be a factor behind the reporting of LBP. Some variables linked to consequences of LBP (absence from school or from gym and visit to a doctor) play a significant role in reporting LBP, which suggests that those “health care” factors may reinforce a feeling of disease severity.

Keywords Low back pain · Children
Introduction

There is more and more evidence that non-specific low back pain (LBP) is common among children and adolescents [1, 2, 7, 8, 9, 11, 12, 13, 14, 17, 24, 31, 32]. Most of the reported studies are cross-sectional. Some, however, are longitudinal: Burton et al. followed a cohort of 216 adolescents between the ages of 11 and 15 over a period of 5 years, and reported figures of annual incidence of LBP increasing from 11.8% to 21.5% over the follow-up period. Lifetime prevalence of LBP increased similarly from 11.6% at age 11 to 50.4% at age 15 [9]. These results are in agreement with the results of Ehrmann-Feldman, who reported on 377 schoolchildren (mean age: 13.8 years) with no antecedents of LBP, and found a 1-year cumulative incidence of LBP of 17.2% [13]. Other longitudinal studies have been published by Brattberg in Sweden and by Nissinen and co-workers in Finland. The former followed 597 children aged 8 and 13 years, who were followed for 2 years. The incidence of LBP was 20% during the follow-up period [6]. The latter followed for 1 year 859 children aged 12.8 years, and found an incidence of LBP of 17.6% [23].

A significant proportion of adolescents report recurrent or chronic pain [4, 19]. In a retrospective study of 648 paediatric patients, Combs and Caskey reported that „back pain with no organic cause” was the most frequent primary diagnosis (57.4%) [10]. Salminen and co-workers performed a prospective study with a 3-year follow-up, comparing adolescents with and without LBP [26]. These authors concluded that their results “favour the hypothesis of a causal relationship between the early evolution of degenerative process of lower lumbar discs and frequent LBP in some young persons” [26]. This topic was recently reviewed [4, 33, 35].

Concerning the value of routine school examinations, Hertzberg studied the predictive value of such examinations by means of a comparison of the school health records of 302 subjects examined at the age of 16 with the results of a survey carried out 9–12 years later. No consistent risk factor for lumbar pain was found in that study [16]. From this overview of the literature, it appears that most studies concerning non-adults have focused on adolescents.

We report on a longitudinal prospective study aimed at finding the incidence of selected factors and evaluating possible prediction of LBP in schoolchildren, aged 9–11 years, in the state school system.

The literature reviewed above indicates that this is a younger age group than has previously been studied, except for the cross-sectional study by Mierau et al. [20].

Materials and methods

Recruitment of schools

This study was performed on school children in the city of Antwerp, Belgium. Antwerp has a state and a religious (Catholic) school system. All schools are co-educational. Schooling is compulsory, free of charge, and there is freedom of choice of school system. This study was performed within the context of the state school medical health system, with the collaboration of the school physicians. The physicians acted as independent examiners of the children at routine compulsory medical examination at 9 and 11 years of age. All children available for medical examination in 1997 were included in the study.

Subjects

At entry to the study, there were 392 children. During the 2-year period between the first (time one, T1) and second (time two, T2) examination, a restructuring of the school medical health system was introduced. This happened without prior knowledge of the research team involved in this study. The result was that certain schools were referred to a medical health centre outside the city boundaries. This left a total of 287 children available for the longitudinal study.

Questionnaire

At the first examination (T1), all children were asked to fill in a questionnaire. The survey (published as an Appendix in a previous issue [15]), included questions on: demographics (age, gender), perception of vision and hearing, need of spectacles, need of braces, leisure time activities (television watching, video games, sports activities, sports competition), sleep patterns and tiredness, perception of health and happiness, back pain (prevalence, disability of back pain, healthcare utilisation, parents’ back pain) and walking pattern to school and type of school satchel, including carrying style. The questionnaire was composed of easy yes/no questions and visual analogue scales. Two years later (T2), the children were asked to fill in the same questionnaire again. This time there were two additional questions: “Do your parents smoke?”, and “Are your parents divorced?” The children filled out the questionnaires themselves at the annual school medical visit. Their own regular teacher gave them instructions on how to fill it in.

Medical low back examination

The routine medical examination was performed in an identical manner by the same school doctors at T1 and T2. The medical examination included measurement of height (barefoot) and weight (undressed); inspection of posture (normal, hyperkyphotic, hyperlordotic, scoliosis and flat back), pelvic area (normal, café-au-lait spots, hypertrichosis, sinus and lipoma) and lower extremity (gena vara, genu valga, flat feet, hollow feet and valgus feet); testing for left and right sacroiliac pain (trunk forward and lateral flexion – finger to floor distance); and testing for painful palpation (ilio-lumbar ligament, processus spinous L1-S1 and the paravertebral muscles in the lumbar area). The physicians were blinded to the results of the questionnaires and medical evaluation at entry to the study (T1).

Statistical analysis

An independent student not participating in the study entered the data. Accuracy of data entry was tested on 30 questionnaires.