The Epidemiology of Low Back Pain in an Adolescent Population

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ABSTRACT

We assessed the prevalence of low back pain (LBP) in a cohort of 1242 adolescents (aged 11 through 17) currently participating in a 4-year prospective study of medically treated injuries. Overall, 30.4% of the adolescents reported LBP. The impact of LBP in adolescents was considerable, with one third resulting in restricted activity and 7.3% seeking medical attention. Life-table analysis demonstrated that by age 15, the prevalence of LBP increased to 36%. There were few differences by gender or race. These results suggest that LBP in adolescents is a serious public health problem. (*Am J Public Health.* 1992;82:606–608)

Introduction

Recent figures indicate that 70% to 80% of the general population will suffer from low back pain (LBP) at some point in their lives.[1–3] Research on LBP has focused primarily on occupational studies in adult populations. Little is known about the development of LBP in children. The epidemiology of LBP in adolescence is of particular importance, as LBP may occur initially during this time and may foreshadow the subsequent severe, chronic morbidity seen in adulthood.

There are only limited data on the prevalence of LBP in adolescents, probably because the disorder in this age group has been thought to be rare. Turner and colleagues[4] found that less than 2% of all children under age 15 presented with LBP at an orthopedic practice. Additionally, Grantham,[5] a school doctor in Northamptonshire, United Kingdom, found that 11.5% of his adolescent male students were seen because of LBP. In contrast to these clinical studies, two school-based studies from Europe have shown that backache may be quite common in this age group. Specifically, Balague et al.[6] found that 27% of 1715 Swiss school pupils complained of LBP as assessed from a validated questionnaire. A similar prevalence of LBP (26%) was found in English school pupils studied by Fairbank et al.[7]

From these few studies, the prevalence of LBP in adolescents in the United States is not clear, nor are the demographic factors associated with the disorder. In addition, there is no information concerning when the first symptoms of LBP appear in populations. Therefore, the proposed research evaluated for the first time in the United States the epidemiology of LBP in a biracial population of adolescents.

Population and Methods

Data on LBP were collected as part of an ongoing prospective population-based investigation of the epidemiology of adolescent injuries. The population undergoing injury surveillance consisted of 1246 (89%) of the 1400 seventh through ninth graders from an urban school district in Allegheny County, Pa. The demographic characteristics of the school district were virtually identical to those of the county.

LBP was ascertained using a modified questionnaire of Fairbank et al., a copy of which is included in the Appendix. The questionnaire was designed to identify any occurrence of LBP in adolescents, its severity, age of onset, recurrence, activity limitation, and medical treatment. The reliability of the survey has been found to be high, with an 84% consistency rate over 6 months.[2]

Results

Ninety-nine percent (1242/1246) of the students participating in the study completed the LBP questionnaire. Table 1 presents the demographic characteristics of the sample. There were 641 male and 601 female subjects 11 through 17 years of age, with an average age of 13.6 years. This represented students in grades seven (32.7%), eight (33.0%), and nine (34.3%).

A surprisingly high percentage, 30.4% (95% confidence interval [CI] = 28.7, 32.2) of the children reported ever experiencing low back pain (Question 1). Twenty-two percent (95% CI = 20.5, 23.0) of the children reported experiencing LBP within the previous 12 months (Question 3). Seven percent (95% CI = 6.9, 7.7) of those who reported LBP sought medical attention at least once (Question 5). There was a greater prevalence of LBP leading to medical attention for girls, 8.0% (95% CI = 7.4, 8.7) vs boys,

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6.7% (95% CI = 6.2, 7.2). In addition, 8.8% (95% CI = 8.3, 9.3), of the students indicated that the back pain was sufficiently severe to force them to miss school or keep them from playing sports (Question 4).

Figure 1 presents the prevalence of LBP by age and race. The only difference in LBP prevalence when examined by race occurred at age 15 where Blacks had significantly higher rates than Whites (47% vs 31%, $P < .05$).

Life-table analysis, as seen in Figure 2, demonstrated that by age 15 the likelihood of this cohort reporting LBP was 36%. There were no differences between boys and girls at any age. It should also be noted that LBP was rare under age 10. This finding can, however, be potentially related to subject recall. Low back pain was additionally analyzed by the hazard function in Figure 3, which can be interpreted as an age-at-onset incidence curve. There was a markedly accelerating incidence of LBP beginning at about age 10, with a continuously increasing risk through adolescence. By age 15, the risk of reporting the first occurrence of LBP was twice that of 12-year-olds, suggesting that the yearly risk of LBP increases dramatically during the teenage years.

Discussion

These results suggest that 1 in every 3 adolescents report experiencing LBP in their lifetime. If these results are extrapolated to the oldest age group, by age 15, 36% of the children would be expected to report the occurrence of LBP. Thus, LBP in adolescent children is a serious public health problem.

Our results are consistent with those seen in European population-based studies. Specifically, Fairbank et al.[7] and Balague et al.[6] found LBP rates of 26% and 27%, respectively.

Approximately one third of the self reported LBP was associated with activity limitations, with one in four of those suffering from LBP seeking medical treatment. Although this represents 3% and 2% of our adolescent cohort, respectively, the economic and public health implications are substantial when one considers the young age and recurrence potential. In a compreshensive review of the literature, Kelsey et al.[3] report that the first episode of LBP occurs most often between the ages of 20 and 40 years; however, these data have been based on recall of adults sometimes decades after the initial episode. Furthermore, costs associated with adult LBP presently exceed estimates of $16 billion.[8] Our results suggest that the initial onset and subsequent cost of LBP, may, in fact, occur early in youth.

There was a similar proportion of reported LBP in boys (30.7%) and girls (30.0%). As presented, it was unlikely that the LBP in girls was exclusively related to menstrual cycle because of the lack of sex differences. It is possible that potential determinants for LBP are thus similar for boys and girls.

The only observed racial differences in LBP were observed in the oldest adolescents. By age 15, blacks reported significantly higher prevalence rates of LBP than whites. There has been no other population based studies in children where it has been possible to examine race-specific prevalence rates.

Our findings, in accordance with other research, suggest that LBP in adolescents is potentially a very serious prob-

TABLE 1—Population Characteristics

Demographics	Cohort (n = 1242) n	%
Sex		
Male	641	51.6
Female	601	48.4
Race		
White	900	72.5
Black	303	24.4
Other	32	2.5
Age		
11	1	0.1
12	202	16.3
13	369	29.7
14	395	31.8
15	233	18.8
16	38	3.1
17	4	0.3
Grade		
7	406	32.7
8	410	33.0
9	426	34.3

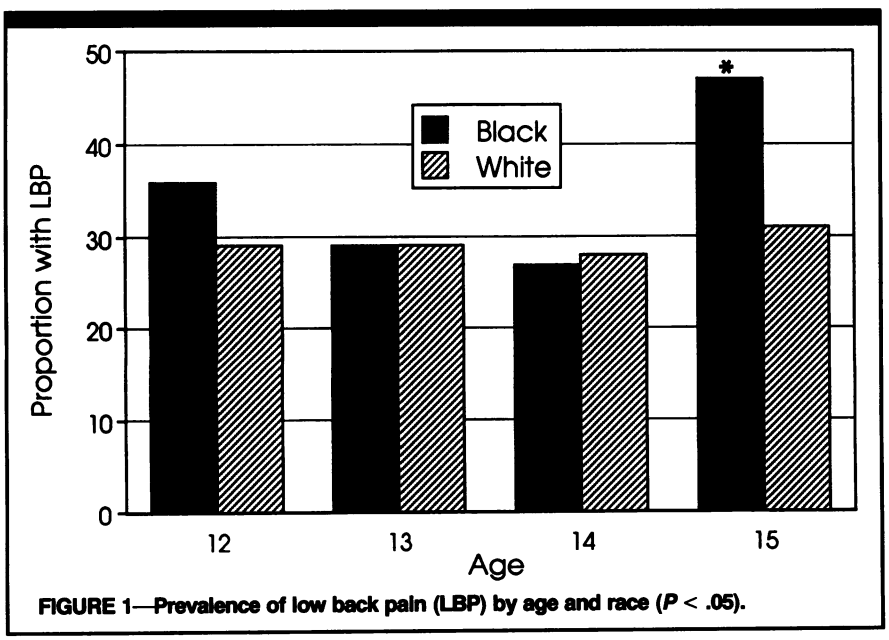

FIGURE 1—Prevalence of low back pain (LBP) by age and race ($P < .05$).

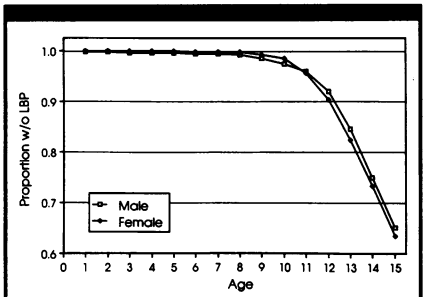

FIGURE 2—Life-table analysis of low back pain (LBP) for boys and girls.

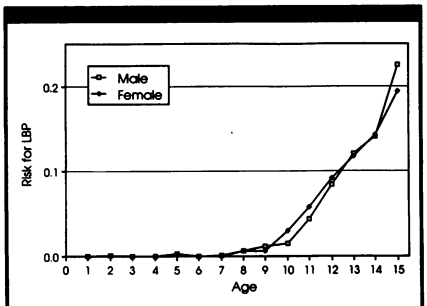

FIGURE 3—Instantaneous hazard function for boys and girls.

APPENDIX—Low Back Pain Assessment by Descriptive Questionnaire

1. Have you ever had pain or other trouble with the lower part of your back? (yes/no)
2. How old were you the first time that you had trouble with your back? (__ years old)
3. Have you had pain or other trouble with the lower part of your back within the last 12 months? (yes/no)
4. Has your back pain ever stopped you from going to school or playing sports? (yes/no)
5. Have you ever seen your doctor about back pain? (yes/no)

lem. Future research in adolescents must address the etiology, associated risk factors, and severity and the degree to which these predict subsequent recurrence of LBP. This may help to identify those adolescents who are at greatest risk for developing debilitating LBP in adulthood so that preventive measures can be undertaken to reduce its occurrence. □

Acknowledgments

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