

# Music-related Overuse in Secondary Schools

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## Abstract

Forty-nine girls and 49 boys who attend secondary schools in Australia and participate in orchestras were surveyed for the presence of music-related pain. Sixty-three percent of female musicians and 49% of males gave a history of such pain as compared with 12% of female non-musician controls and 14% of male controls. Findings related positively to practice times but bore no relation to age or grade in school.

## Introduction

Music-related painful overuse in the tertiary music school has been reported to occur in a minimum of 10% of students,<sup>1</sup> although the prevalence in orchestral musicians over 30 years old is reported to exceed 50%.<sup>2</sup> In studying the tertiary school students it appeared that the onset of overuse often occurred at the level of the secondary school. One previous large series suggests that girls are much more vulnerable to this disorder than are boys.<sup>3</sup> The present study was undertaken in an attempt to discover the nature and extent of the disorder in high-achieving musical groups in the secondary school.

## Methods

Two non-coeducational regular schools with strong music departments and experienced orchestras were selected for this study. A questionnaire was handed out without prior warning to all players attending a particular rehearsal. By coincidence the numbers at both schools was the same: 49. (The total orchestral membership at the girls' school was 60 and in the boys' school was 75.) All 49 players present at each rehearsal completed the questionnaire. This study was conducted in late September 1987 at the girls' school and in early October at the boys' school. In both schools this was close to the time of academic examinations as well as musical juries.

An age- and sex-matched control group was obtained from students at each school who did not play musical instruments. They completed a questionnaire modified to exclude questions about musical activity.

The average and maximum practice hours were sought. Description of music-related pain included its past and present occurrence, whether there was pain at rest or with non-musical activities, the duration of symptoms, and loss of musical facility as well as its onset in relation to increased practice. Students were not individually interrogated or examined, nor was location of pain investigated. Chi-squared analyses were used for significance where applicable.

## Results

Table 1 shows age distribution and means of subjects and controls. Table 2 shows the symptomatology of the musicians and Table 3 that of the controls.

The girls' practice hours (average mean 1.5 hours plus/minus 0.78, maximum mean 2.7 plus/minus 1.2) were greater than the boys' (average mean 0.8 plus/minus 0.78, maximum mean 2.0 plus/minus 0.49). In neither group did practice hours correlate with age or grade.

In the control group pain on hand use (mainly from writing) occurred in 12% of the girls and in 14% of the boys. This was in contrast to the musical subjects in whom the reported occurrence of music-related pain (past or current) was 60% in girls and about 50% in boys. These figures are significant against controls ( $p=0.000000189$  for girls, 0.0002 for boys), although the difference between girl and boy musicians was not significant. All but 8 of the affected boy musicians and 7 of the girls developed symptoms in relation to increased practice.

Of those with current, persisting pain the rate among boy musicians was at the same level as the controls, but the girl musicians reported more than a 50% occurrence of

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**TABLE 1. Age Distribution for Control and Orchestral Groups**

Age*	No. of Students	
	Girls	Boys
13	5	—
14	10	6
15	8	15
16	14	10
17	9	17
18	3	1

\*Girls: 15.4 yrs. mean; boys 15.8 yrs. mean.

**TABLE 2. Symptoms in Orchestral Musicians**

Symptoms	Girls (N=49)	Boys (N=49)
Pain with playing (past or present)	31 (63%)	24 (49%)
Persisting pain (present)	26 (53%)	7 (14%)
Pain at rest	8 (16%)	4 (8%)
Pain with non-musical activity	15 (30%)	5 (10%)
Duration of pain		
<6 months	3 (6%)	4 (8%)
6 months-4 years	17 (35%)	11 (22%)
unknown	11 (22%)	2 (4%)
Technique affected	11 (22%)	5 (6%)

**TABLE 3. Pain from Hand Use in Control Groups**

Symptoms	Girls (N=49)	Boys (N=49)
Pain from hand use	6 (12%)	7 (14%)
Pain from writing	5/6	5/7
Pain duration ≥ 1 yr.	5/6	—
Pain duration > 2 yrs.	—	4/7

current persistent pain as compared to controls 12% ( $p=0.000016$ ). The difference between girl and boy musicians was likewise significant ( $p=0.00001194$ ).

Although girls reported twice the occurrence of pain at rest as did boys, the difference was not significant ( $p=0.220$ ). On the other hand, pain relating to non-musical activity was reported three times as frequently by the girls as compared with the boys and was significant ( $p=0.1010$ ).

The duration of symptoms was greater in the girls than the boys but the difference was not significant ( $p=0.1417$ ). Nearly four times as many girls as boys had other school activities affected by their music-related pain, the difference between girls and boys being significant ( $p=0.0209$ ).

## Discussion

These two senior school orchestras are regarded as two of the best in Australia. They perform frequently overseas

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as well as at home. The two schools are also academically excellent so that these students represent high achievers both musically and scholastically. Overuse in high-level musical achievers has been previously documented.<sup>4,5</sup>

It is of considerable interest that in an age-matched sample in each school there was a 12-14% prevalence of use-related pain mainly attributed to writing. This occurrence rate in children should not be accepted complacently. It appears that many individuals use excessive muscle power and tension in everyday activities. This should be examined along with similar problems in the musicians.

It is evident that in general girls are considerably more affected than are boys. These differences are hard to reconcile merely with the modestly greater practice hours and musical achievement of the girls. One cannot exclude the possibility that the boys were in reality more affected than they were prepared to admit. It has been previously noted in one large series that of 299 female musicians between the ages of 10 and 20, 95 (32%) suffered overuse, as compared with 36 (10%) of 359 males.<sup>3</sup> Manchester in his series of music conservatory students found females showed twice the incidence of music-related hand pain as did males.<sup>6</sup>

## Conclusions

It appears that adolescent females are especially vulnerable to music-related overuse and that preventive strategies should be vigorously applied. The growing hand, the tendency of talented girls to skip grades, the profound chemical changes taking place in connective tissue associated with the hormonal changes of puberty all may be factors that put them at greater risk than their male counterparts. In addition, the strong correlation between the onset of symptoms and increased practice highlights the danger of preparing for concerts and juries.

## References

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