LETTERS TO THE EDITOR

Dear Sir,

Gregorič et al. (1981) recently presented a report in this journal on "Postural control in scoliosis". In a statokinesimetric study they compared the postural equilibrium in patients with idiopathic scoliosis with the postural equilibrium in patients with scoliosis due to neuromuscular disorders and with that in normal subjects. They concluded that their patients with idiopathic scoliosis did not show any significant differences from normal subjects. In addition, they stated that postural equilibrium in patients with neuromuscular scoliosis is more efficiently controlled than in normal subjects.

However, their results are based on dubieties as regards material and methods used.

Many different factors influence postural sway. Age and sex are two of the more important ones (Hirasawa 1973, Sheldon 1963), especially during the maturation period.

No data on the sex distribution are given in any of the three groups. The patients with idiopathic scoliosis had an age range between 8 and 17 years, mean 13.1 years. As to the patients with neuromuscular disorders apparently only 24 out of 39 patients were in their maturation period, aged 5 to 18 years, mean 11.2 years. What about the other 30 individuals (56 per cent) in this group? Were these adults? The characteristics of postural sway are different in the age between 5 and 10 years and in adulthood. In adults postural sway is better controlled than during the maturation period (Hirasawa 1973, Sheldon 1963). A different age distribution from the one given might therefore be one explanation why a better postural control was found in patients with neuromuscular disorders than in patients with idiopathic scoliosis.

Long C-shaped scoliosis develops in neuromuscular scoliosis; a characteristic that often can be clearly distinguished from idiopathic curvature. The authors stated that the morphological characteristics of the scoliosis in their neuromuscular patients did not differ from those in their patients with idiopathic scoliosis. We are curious to know what criteria Gregorič et al. used when categorizing a scoliosis to the idiopathic gruoup.

The results in the different groups were obtained in two different ways. All of the statokinesimetric recordings were analyzed quantitatively by means of on-line computer analyses in the patients with idiopathic scoliosis and in 11 of the 54 patients with neuromuscular disorders. The other patients, 80 per cent of the neuromuscular patients and the normal subjects, had their recordings analyzed semiquantitatively by means of a planimeter. These circumstances apparently did not prevent the authors from making a comparison of these results with the results obtained exclusively by the quantitative on-line computer analyses in the idiopathic group. In our opinion such a comparison can not be defended.

In view of the shortcomings found as regards both material and methods used we are of the opinion that the results of Gregorič et al. were obtained in such a way that it is open to question if the authors were justified in drawing their conclusions.

REFERENCES

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Dear Mr. Editor,

Thank you for sending us the critical comments by Dr. Sahlstrand and his co-workers. We should like to answer their questions and give additional explanation.

1. We are aware of the paper by Hirasawa (1973) who found ability for more stable standing in girls as compared to boys, but the difference disappeared at 10 years of age, after which stability in either sex became similar to that in adults. Similar intersex difference below the age of 10 years was more recently demonstrated by Odenrick & Sandstedt (1982), but only when testing with eyes open. Furthermore, the stability of normal children aged between 9 and 12 years did not differ from normal adults in our own laboratory (Oblak 1979). Only a few of our patients with idiopathic scoliosis were younger than 10 years and the control group was carefully matched for age, as stated in the paper. Thus we exclude the possibility that age or sex dependent variability could have appreciably influenced our comparison between these two groups.
2. The *scoliotic children with neuromuscular disorders* (with the exception of patients with peroneal muscular atrophy) were compared to normal children of the *same age group* and the differences were highly significant. Stability in this group of scoliotic children was indeed quite striking and was significantly greater even when compared to a group of normal adults.
3. Idiopathic scoliosis was as diagnosed according to the internationally accepted clinical and radiological criteria (cf. James 1954, Scheier 1967), and by careful exclusion of any recognizable anomaly or pathological process known to produce symptomatic scoliosis. Scoliosis in our neuromuscular patients was also carefully evaluated, particular attention being paid to distinguish it from non-scoliotic curvatures. All of our neuromuscular patients were still in ambulatory stage of their disorders and none had a C-shaped scoliosis. No systematic morphological difference could be found between the neuromuscular and the idiopathic group as regards lateralization, extent or degree of the major curve or two major curves when present, or localization of the apexes.
4. The normal subjects were studied quantitatively by on-line computer analysis in the same way as all patients in the idiopathic and 11 patients in the neuromuscular group, as is evident in the Results section. No illegal comparisons as suggested by Dr. Sahlstrand have been made. The manually analysed statokinesimetric recordings of the additional 43 neuromuscular patients are not used for any quantitative comparisons but have been included in the paper to show that a similar degree of balance control is the rule also in a larger population of patients with these disorders, whether they have scoliosis or not.

To conclude, we do not believe that the criticism by Dr. Sahlstrand and his colleagues in any way invalidates our results and conclusions. We should like to repeat our final statement that our study does not support the possibility that disordered postural equilibrium is a causative factor in idiopathic scoliosis although it can not be taken as evidence against it.

REFERENCES

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Dr. Milan Gregorič and co-workers.