airway hyperresponsiveness is a matter of debate, with opinion being divided in the nearly 20 references that we have been able to find on the subject. We are also in full agreement about the confounding effect of environmental influences and about the need for further study. Unfortunately, a cross sectional study of elderly normals vs elderly asthmatics (of similar design to the current study) would be methodologically difficult because of functional antagonism between methacholine and β-agonist drugs. The very large differences in the dose of methacholine needed to provoke bronchoconstriction in elderly asthmatics compared with that in elderly normals would almost certainly mask any more subtle differences in β-agonist sensitivity. We have confirmed this latter point in an unpublished pilot study involving 33 subjects and completed in 1989. A longitudinal study is obviously the ideal, and we hope to be able to report the results of such a study in the future.

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Effects of Noninvasive Ventilation on Survival in Patients With Duchenne's Muscular Dystrophy

To the Editor:

In Japan, a half of an estimated total of 2,400 patients with Duchenne's muscular dystrophy (DMD) are currently hospitalized under the national hospital care program, which was established in 1964 and has provided the free and life-long institutionalized care, rehabilitation, and schooling.1 In this letter, we are showing the effects of noninvasive ventilation, nasal intermittent positive pressure ventilation (NIPPV), or negative pressure ventilation with cuirass respirator (CR), on the survival in patients with DMD under this national program.

We retrospectively analyzed the life span of 99 inpatients in a sanatorium during the recent 16 years from 1980 to 1995. Eighty of these patients died and the other 19 are currently treated with NIPPV. Before 1987, we had not used any respiratory assistance (nontreated group: n=65). In 1987, we first introduced CR (CR group: n=7). In 1991 and 1992, we replaced CR with NIPPV and have used NIPPV solely thereafter (IPPV group: n=27). In the IPPV group, 7 patients had experienced the antecedent CR lasting for 6 to 60 (mean: 25.7) months before the initiation of NIPPV and 8 patients were resuscitated tracheostomized due to the need for full-time respiratory support. The reasons of the replacement of CR with NIPPV were the discomforts and coldness, the improper respiratory assistance with CR, which was presumably the result of the upper airway obstruction during CR and/or the air leakage from the body-cuirass or the body-poncho interface, and the extreme labors of the medical staffs to initiate the nightly CR.

Figure 1 is the relationship between the rate (S: vertical axis) and the days (D: horizontal axis) of survival in the three groups of patients with DMD. Ages at which 50% of the subjects were estimated to die were 20.1 years in the Nontreated group, 21.0 years in the CR group, and 30.4 years in the IPPV group respectively. The results obviously showed that noninvasive ventilation with NIPPV prolonged the life expectancy in patients with DMD, as was shown by Vianello and coworkers2 in the recent issue of this journal.

There are some limitations of the present investigation. The first is the retrospective style of the study. The second is the heterogeneity of the direct causes of the death, which included respiratory failure in most of the cases and heart failure in the rest of them. The third limitation is the difficulty to distinguish the effects on the life span between CR and NIPPV, which were due to the lack of numbers of the patients treated with CR. Despite these limitations, we believe our brief communication bears the clinical importance in the historic aspects of the treatment of chronic respiratory failure in patients with DMD in Japan.

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