Home mechanical ventilation. A growing challenge in an aging society

(Editorial)

Simplified ventilator technology and spin off effects from the diagnostic advances of sleep medicine are two key factors behind the increasing application of home mechanical ventilation (HMV). There are consensual reports from many countries [1-4] that HMV treatment prevalence is increasing, and a steady state seems not to has been reached. One part of the explanation is that HMV prescription is still cumulative, *i.e.* new patients are started on HMV at considerably higher rate than they die off. Another factor affecting the treatment prevalence is the increasing number of elderly, due to the progressive increase in life expectancy in the western countries. Moreover, today´s elderly have a substantial potential for long, disability-free, active and fulfilling lives [5]. One might assume that diminishing numbers of patients with "old diseases", such as post-polio, unfused scoliosis or tuberculosis sequelae, would dampen the increasing need for HMV services, but this seems not yet to be the case. Furthermore, the Pickwickian patients constitute a rapidly growing (in a double sense) problem [2].

This issue of Respiratory Medicine presents two reports with data that should be of interest for those who provide respiratory home care. Farrero et al [6] focus on the elderly (75+) patients, who comprise 8% of the total number of patients on HMV at their clinic in Barcelona. This figure is not unreasonable, the Swedish Ventilator and Oxygen Register (Swedevox) reports that 12% of adult Swedish HMV patients are older than 75 years [7]. Farrero et al found a significantly higher rate of early uncompliant patients among the elderly (11% vs 4% for patients below 75). The corresponding figures from Sweden (Swedevox, unpublished data) are 6,0% vs 3,5%, a difference that is not significant (although early failures may be underreported). Finally, Farrero et al found good long-term results for compliant elderly patients (improvement in blood gases as well as for hospitalisation rates).

The results of Farrero et al are supported by those of Laub et al [7], who in a nationwide prospective study found significant but nevertheless relatively small effects of age on survival in the HMV population (figure). A five-year survival of almost 50% for HMV patients aged 75 or more [6,7] is not a bad figure compared to many other treatments for life-threatening

disorders. Both Farrero and Laub report (not unexpectedly) that patients with amyotrophic lateral sclerosis (ALS) have by far the worst survival, with a eightfold risk for death in ALS vs nonALS in the Laub study. The data presented by Laub indicate that other diagnosis-related differences in survival are of limited magnitude, with a relative risk of two between worst (lung and tbc) and best (scoliosis, Pickwick). The results contrast to survival data from smaller retrospective studies [8], which points to the problems of case mix and patient selection in single centre studies. The conclusion that can be drawn from the studies of Farrero and Laub is that neither age nor diagnosis *per se* (except ALS) should be important factors in the HMV decision making. Age alone is a poor marker of potential clinical benefit of HMV therapy.

A thought-provoking finding in the Laub study is that concomitant oxygen was associated with a worse prognosis. This may of course reflect a larger component of lung parenchymal disease. From my personal experience, however, concomitant oxygen is only occasionally required, once the ventilator settings have been adequately adjusted. This point of view is at least partially supported by the observation that bigger centres (with presumed larger experience) used concomitant oxygen only half as often as did smaller centres.

The Laub study tries to address a question that seldom has been studied in previous investigations, namely if survival is dependent on caregiver related factors. Earlier data from the Swedevox register show that there are considerable differences in the provision of HMV, with respect to centre size (and presumed experience) and geographical prevalence (availability? utilization?) of HMV [2]. According to Laub´s data [7], these quantitative differences do not affect survival. The somewhat surprising finding that centres with more experience do not report longer patient survival could perhaps be due to differences in case mix. With greater experience, these centres may be more willing to care for the difficult cases, with complex risk factors that may not be reflected by simple register data, such as diagnosis, lung function data, blood gases and age.

In conclusion, these two reports indicate that HMV should be provided according to clinical needs, i.e. symptomatic hypoventilation, regardless of age, underlying diagnosis (with ALS as a case for discussion) or hospital size. Due to considerable differences in case mix and clinical practice between different HMV centres, future studies on prognostic factors must be multicentric or based on national registers.

References

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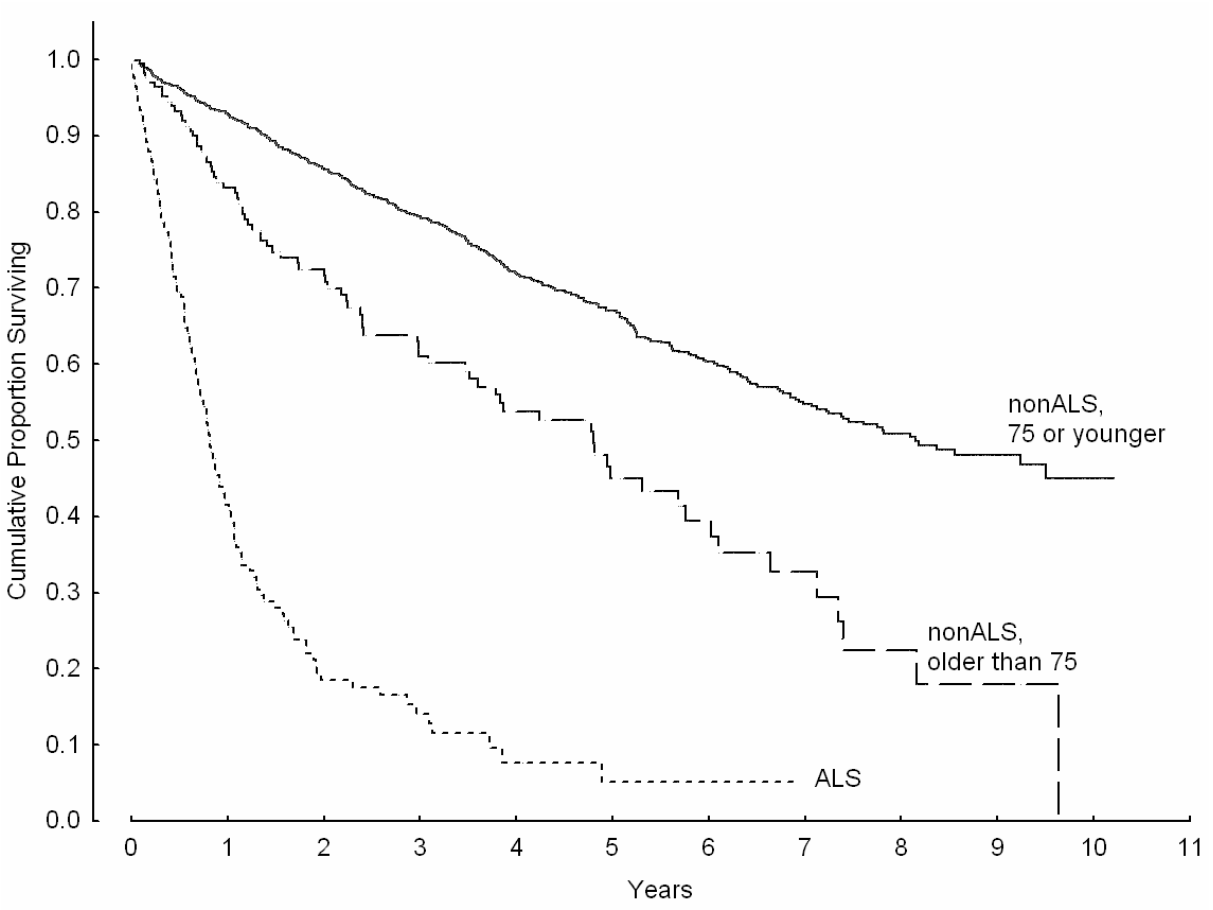
Legend to figure

Kaplan-Meyer plot of survival in 1526 patients (580 deceased) on home mechanical ventilation, prospectively followed in the Swedish Ventilator and Oxygen register (Swedevox), based on [7] and previously unpublished data.


Cumulative Proportion Surviving
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
1
2
3
4
5
6
7
8
9
10
11
Years
nonALS,
75 or younger
nonALS,
older than 75
ALS