SYMPTOMS OF RESPIRATORY FUNCTION INSUFFICIENCY AND ARTERIAL BLOOD GASES ANALYSIS AS PROGNOSTIC INDICATORS IN ALS

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INTRODUCTION

Many patients with amyotrophic lateral sclerosis (ALS) develop symptoms of respiratory insufficiency during the time of the disease and for the majority respiratory failure is the cause of the death (1). We were interested in usefulness of symptoms of respiratory insufficiency and/or abnormal results of the daytime arterial gas analyses as indicators (AGA) for initiation of non-invasive mechanical ventilation (NIV) and if they are predictive for survival.

METHODS

Clinical and laboratory data of 82 patients with ALS, who were followed by our ALS clinic since October 2002 and died before July 2008, were analyzed retrospectively. Patients were regularly followed at 3-month intervals. We questioned them about the symptoms of respiratory insufficiency (dyspnoea, orthopnoea, morning headaches, nightmares, disturbed sleep), and performed arterial gases analyses. The last AGA was on average performed 65 days before death (range: 1–702 days, SD 130). Patients with respiratory infections or lung disease were excluded from study.

RESULTS

Mean age at the disease onset was on average 70 years (SD 11). Fifty-three patients reported symptoms of respiratory insufficiency which started 23 months after the disease onset (range 0–108 months, SD 22) and died on average 9 months later (SD 9). These patients had slightly longer survival (29 months from the disease onset (SD 21)) compared to those without respiratory problems (mean 25 months, SD 14), but the difference was not significant ($t = 0.89$, $p = 0.38$). Thirteen symptomatic patients and/or those with increased p_{CO_2} saturation underwent a NIV trial but only seven of them used it for at least 4 hours per night (good compliance). They, on average, survived for 312 days (range 52–485 days, SD 150) after the onset of respiratory insufficiency. Those who did not comply with NIV, survived for 258 days (range 3–1347, SD 279). The difference was not significant ($t = 0.50$, $p = 0.62$). At least two arterial gas analyses were performed in 48 patients. Only 48%, 67% and 27% of patients had abnormal p_{CO_2}, p_{O_2} and oxygen saturation, respectively, at any time of the disease course. Symptoms of respiratory insufficiency most commonly preceded AGA abnormalities and much less frequently occurred concurrently or afterwards. AGA abnormalities could even not be detected at all. First abnormalities in p_{CO_2}, p_{O_2} and oxygen saturation were found 160, 297 and 108 days before death, respectively. NIV tolerant and intolerant patients had similar survival (143 compared to 150 days on average) when measured from the first abnormal p_{CO_2} result. Similar non-significant differences were found also, when low p_{O_2} values and oxygen desaturation were used as starting point of survival measurements. Mean age at the disease onset was at 70 years (SD 11).

CONCLUSION

In our small group of patients, the occurrence of symptoms of respiratory insufficiency and arterial gases abnormalities did not affect survival and are therefore unlikely to be useful as only indicators for NIV initiation.

Reference:

1. Borasio GD, Gelinas DF, Yanagisawa N. Mechanical ventilation in amyotrophic lateral sclerosis: a cross-cultural perspective. J Neurol 1998; 245 (Suppl 2): 7–12.