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Short reports

Ventilatory failure in the Guillain-Barré syndrome

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Paralysis of respiratory muscle is an important feature of the Guillain-Barré syndrome, and when severe may cause death from ventilatory failure. Early detection of failure is clearly important. Measurement of the peak flow rate and the arterial $Paco_2$ are important aspects of assessment of the ventilatory state as the disease evolves.

We wish to report the case of a girl of 14½ years who presented with a three-day history of muscular weakness, with pins and needles in the fingers. On admission to hospital it was obvious that she had polyneuritis. A lumbar puncture revealed a clear fluid containing two white cells and a protein of 1·6 grams/l. The diagnosis of polyneuritis of the Guillain-Barré type was made. At the time of admission the muscle groups of the legs moved with a power of 3 on the MRC scale (that is, against gravity), but within a week the power was zero (gross paralysis). Power in the arms fell from 4 (movement against resistance) to 3 during that same week. Her face, which was normal on admission, became myopathic. No dyspnoea or cyanosis was observed. Retention of urine necessitated catheterisation of the bladder on the seventh day. No further extension of paralysis of the main muscle groups was noted after this time.

Measurements of the peak flow rate and the arterial $Paco_2$ were made at intervals (figure). Ventilatory capacity deteriorated until the end of the third week, at which point it was less than a quarter of its predicted normal value for this subject. However,

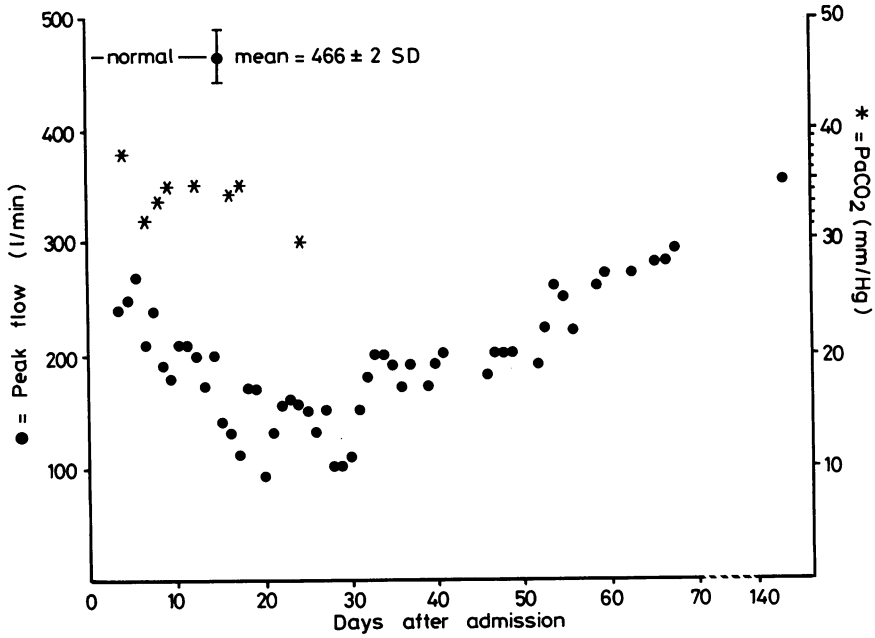

Figure *Changes in peak flow rate and* $Paco_2$ *during progression and recovery from the disease.*

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ventilatory failure did not occur as indicated by normal $Paco_2$ values, and at no time did the patient complain of dyspnoea or become cyanosed. Improvement of ventilatory function occurred at the end of the fourth week but was incomplete at 5·5 months.

Between 1953 and 1978, 34 patients with this syndrome were admitted to Alder Hey Children's Hospital, and five required ventilation. One of these subsequently died of pneumonia, and this was the only death recorded. The criteria for ventilation have not been clearly defined, and there is very little published information. Hewer *et al*[1] discussed ventilatory failure in the child and adult, and concluded that mechanical ventilation may be indicated if the vital capacity falls below one-third of the normal value. Our experience shows clearly that the peak flow rate is a sensitive indicator of diminishing ventilatory reserve at a time when the $Paco_2$ remains normal. Peak flow rate or vital capacity measurements do not predict ventilatory failure, but when they are appreciably reduced, $Paco_2$ should be monitored frequently. In our case, the peak flow rate decreased to one-quarter of predicted normal between the twentieth and thirtieth days. Assisted ventilation was not required but ventilatory reserve must have been minimal. It is at this point that $Paco_2$ estimations are of real value as the indicator of ventilatory failure which would necessitate mechanical ventilation.

We wish to thank Dr RM Todd for permission to study and publish this case report.

Reference

1 Hewer RL, Hilton PJ, Crampton Smith A, Spalding JMK. Acute polyneuritis requiring artificial respiration. *Q J Med* 1968; New Series 37: 479–91.