

POST POLIO PARALYSIS

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SUMMARY

A prospective study was conducted on 49 patients with post-polio paralysis, to observe the preponderance of different group of muscles being involved. In lower limbs the extensor group of muscles are more prone and comparatively more severely effected. The muscles which are frequently injected are more likely to be paralysed.

INTRODUCTION

Muscles most affected with polio virus are those with adjacent motor neuron tracts in the central nervous system and these are the muscles frequently injected. In developing countries considering the high prevalence of polio, the role of injections cannot be neglected.¹ In under-developed countries the quadriceps and gluteus muscles show maximum paralysis and these are the muscles frequently used for injections.

MATERIAL AND METHODS

Record of forty nine successive patients seen in the outpatient department was retrieved. Muscle charts were analysed. The method proposed by Medical research council, known as Oxford grading is most frequently used for muscle testing.⁸

The scale is the following:

- 0 = No contraction.
- 1 = Flicker or trace of contraction.
- 2 = Active movement with gravity eliminated.
- 3 = Active movement against gravity.

4 = Active movement against gravity and resistance.

5 = Normal function power.

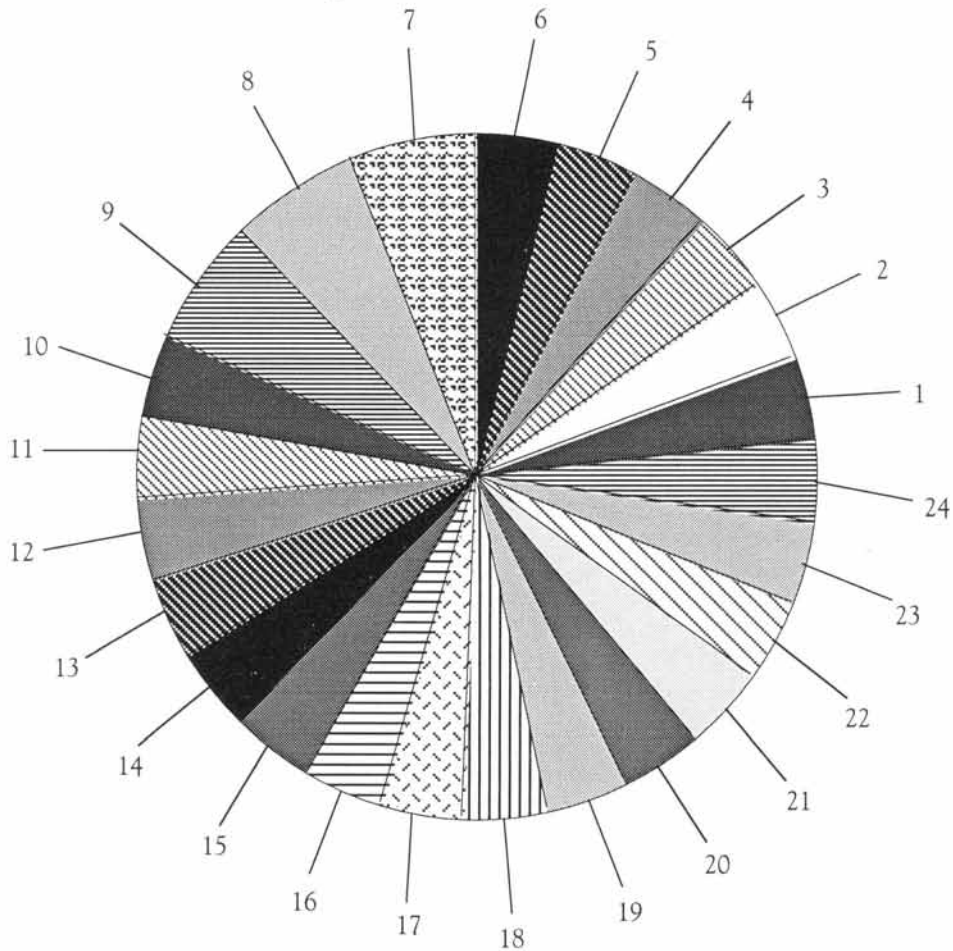
RESULT

We tabulated the muscle power of group of muscles effected with polio. The muscle power chart of 49 patients (chart 1) was taken, which clearly demonstrated that the most affected muscle groups were the Hip extensors, Tibialis anterior, Peroneals, Quadriceps, Abductors, Adductors and Glutei. One can say specifically that the extensors of the hips, knees and ankles are more prone to paralysis and of a severe degree.

DISCUSSION

Muscles which are frequently injected and those with adjacent motor neurone tracts in the central nervous system are more affected. This may implicate, intramuscular injections in the development of post-polio paralysis in the under-developed world. Many parents in our practice actually blame the intramuscular injections, as the cause of paralysis in their children. Many doctors have also noticed that paralysis of a muscle frequently follows

TABLE 1
Muscle power in affected groups



NAME OF MUSCLES SHOWN IN CHART

- | | |
|-------------------------|-------------------------------|
| 1. Gluteus Maximus | 13. Gastrocnemius Standing |
| 2. Ilio-Psoas | 14. Anterior tibial |
| 3. Sartorius | 15. Posterior tibial |
| 4. Tensor Fascia latae | 16. Peroneals |
| 5. Hip Adductors | 17. Extensor Longus Digitorum |
| 6. Hip Abductors | 18. Extensor Brevis Digitorum |
| 7. Hip Rotators inward | 19. Extensor Hallucis Longus |
| 8. Hip Rotators outward | 20. Flexor Longus Digitorum |
| 9. Quadriceps | 21. Flexor Brevis Digitorum |
| 10. Hamstrings Inner | 22. Flexor Lumbricales |
| 11. Hamstrings Outer | 23. Flexor Longus Hallucis |
| 12. Gastrocnemius | 24. Flexor Brevis Hallucis |

after that muscle has been injected. Studies show that intramuscular injections can increase the chances of paralysis by at least 25 times.⁷ In underdeveloped countries the Quadriceps and the Glutei show a very high proportion of paralysis as compared to the developed world. This points toward the fact that these muscles are the frequent site for intramuscular injections in our setup.⁷

The anterior division of the spinal plexus supplies flexors, which have rich innervations. While the posterior division supplying the extensor group of muscles have poor innervations. The above mentioned fact may as well account for the more extensor group paralysis.^{3,4}

Studies have shown that the muscles with short motor cell column in the central nervous system are more prone than muscles with long motor cell columns to post-polio paralysis.^{1,7}

The nerve tracts of the Gluteus maximus lies at the S1 and S2 level of the spinal cord, along with the nerve tracts of flexor digitorum longus, biceps femoralis and hip rotators. The tracts of Gluteus minimus and medius lies at the L4 and L5 level along with tracts of Tensor fasciae latae and Quadriceps.^{5,6}

The more extensor group paralysis could also be explained considering the following fact. The constituent of every limb plexus divides into anterior and posterior divisions. The anterior division supplies the flexor compartment and the posterior division supplies the extensor compartment of the limb.⁸ The flexor compartment as compared to the extensor compartment has a rich nerve supply, making it less vulnerable to damage.

In lower limbs the extensor group of muscles is more effected by polio as compared to other muscle groups. It has also been observed that there is some relation between the injection sites and paralysis. Those muscles which are frequently injected are more prone to paralysis.

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