

## ASSOCIATED SPHINCTER NEUROGENIC DEFECT AS A PREDICTOR OF POSTOPERATIVE FECAL INCONTINENCE IN PATIENTS WITH HIRSCHSPRUNG'S DISEASE

### Hypothesis / aims of study

The purpose of this study is to investigate the possible associated neurogenic defects in HD, which might affect the postoperative outcome.

### Study design, materials and methods

This study included 20 newly diagnosed cases of HD (4 females and 16 males) and five age matched healthy controls (1 female & 4 male). Patients were subjected to thorough clinical examination including physical, neurological and rectal examination. Preoperative electro-physiological assessment was performed which included: 1) Electromyographic (EMG) examination: of bilateral External anal sphincter, Puborectalis and Levator ani muscles, using concentric needle electrodes; 2) Pudendal Nerve Terminal Motor latencies, using St. Marks's pudendal electrode; 3) Penile/clitoral anal reflex (sacral reflex)., and 4) Pudendal somatosensory evoked potentials. Measuring the sacral reflex and the pudendal evoked potential allows examination of both segmental and suprasegmental neural pathways to the sacral cord. All patients under-went transanal endorectal pull through operation (performed by the same surgeon). Electrophysiological reassessment was done 6 months later, and clinical follow up lasted for 2 years following the operation.

### Results

Patients' ages ranged from 5 months to 11 years with mean age of  $3.7 \pm 1.27$  years, compared to the control group whose ages ranged from 6 months to 5.5 years with mean age of  $4 \pm 1.4$  years ( $P > 0.05$ ). In the control group, the mean pudendal nerve distal latency was  $2.02 \pm 0.31$  ms, while the mean latency of the sacral reflex was  $33.5 \pm 6.49$  ms. Somatosensory evoked potential mean latency (P40) was  $40.06 \pm 1.47$  ms. Preoperative neuropathic changes (unilateral or bilateral delayed sacral reflex or delayed pudendal nerve terminal latency, and/or EMG neuropathic changes) could be detected in 5 patients (figures 1&2). Four of them developed postoperative incontinence, while the last one developed good continence. Only one patient with normal preoperative tests developed postoperative fecal incontinence. Failure to elicit sacral reflexes and pudendal nerve stimulation, associated with severe neuropathic weakness of the three examined sphincter muscles, were detected in one patient who needed post operative intensive care therapy and died few days following surgery. There was no statistical significant difference between cases and controls ( $P > 0.05$ ) as regards the pudendal nerve somatosensory evoked potential. The specificity of the preoperative electrophysiologic tests as a predictor of postoperative fecal incontinence is 92% while their sensitivity is 83%.

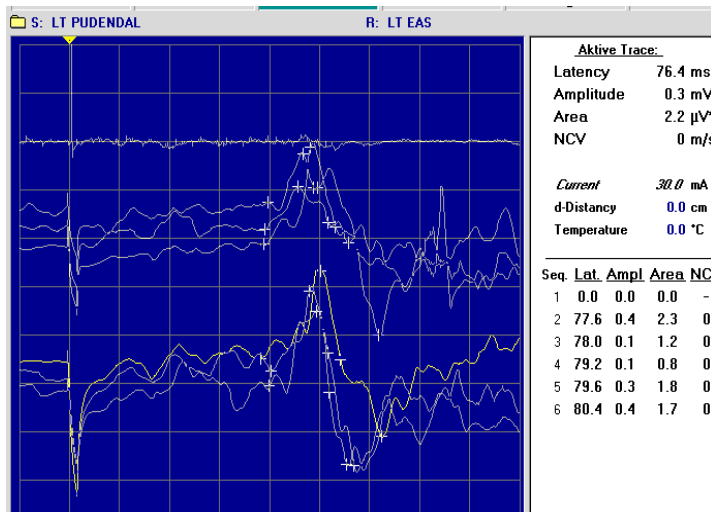


Figure 1: Delayed sacral reflexes

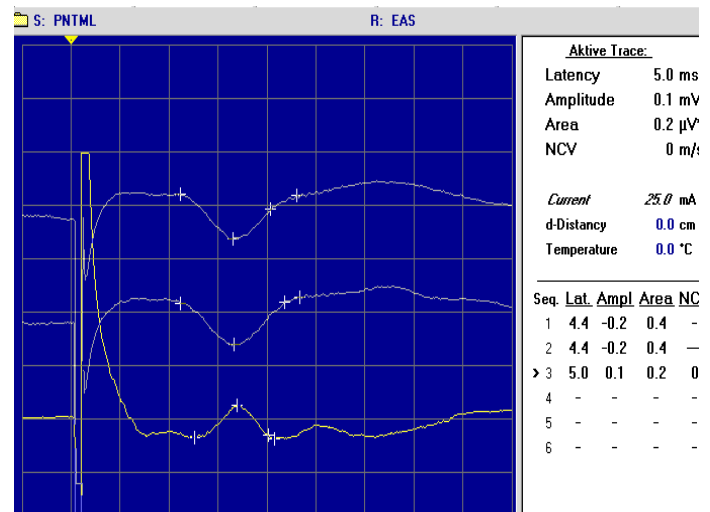


Figure 2: Bilaterally delayed pudendal nerve terminal motor latencies.

### Interpretation of results

In HD, there is an increasingly recognized sub groups who have persistent post-operative fecal incontinence. The possible causes of postoperative fecal incontinence may be intra-operative sphincter damage and/or existing associated anomalies in sphincter muscles or their innervations. Even though numerous studies have been attempted to clarify the pathophysiology of the aganglionic segment, little attention has been paid to the striated muscle function in HD. To investigate the possibility of iatrogenic trauma during operation, pre and postoperative electrophysiologic assessment were performed. Preoperative neurogenic affection of the sphincter muscles was confirmed by the increased pudendal nerve latencies, delayed sacral reflexes and the marked complexity of the motor unit potentials with reduced interference pattern during squeeze. Our findings indicate that when preoperative neurogenic changes to the sphincter muscles are found in a child with HD, he is more liable to get postoperative fecal incontinence. Also, when neurogenic damage of the sphincter muscles is found in a child with a long term incontinence after surgery for HD, it is unlikely to be a simple consequence of surgical trauma, but we have to think of associated neurogenic defects.

### Concluding message

HD may be associated with sphincter neurogenic defect, which could be considered as a predictor for postoperative fecal incontinence.

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<b><i>Is this a clinical trial?</i></b>	<b>No</b>
<b><i>What were the subjects in the study?</i></b>	<b>HUMAN</b>
<b><i>Was this study approved by an ethics committee?</i></b>	<b>Yes</b>
<b><i>Specify Name of Ethics Committee</i></b>	<b>Ain Shams university</b>
<b><i>Was the Declaration of Helsinki followed?</i></b>	<b>Yes</b>
<b><i>Was informed consent obtained from the patients?</i></b>	<b>Yes</b>