

Impact of Intensive Venous Sampling on Characterization of Pulsatile Growth Hormone Release

This study applies a computer-based pulse detection algorithm to growth hormone (GH) data collected every five minutes over a 24-hour period. Previous application of this algorithm using every-20-minute sampling has demonstrated significant differences in pulsatile GH release among different groups of individuals. The present article addresses the adequacy of traditional GH sampling rates and attempts to identify the frequency of sampling necessary to capture the majority of GH pulses.

Seven adult males were studied over a 24-hour period, with sampling for GH done every five minutes. The GH levels obtained were subjected to previously published pulse detection algorithms that excluded intrinsic measurement errors influenced by unstable baselines or non-uniform peak amplitudes. In addition, the algorithm used constrains type I statistical errors to limit the rate of false-positive peaks. In this particular study, *t* statistics were used to constrain the false-positive rate to less than 5%.

The study demonstrates that the number of GH peaks detected is maximal with five-minute sampling, and that twice as many peaks per 24 hours are detected using sampling done every five minutes as opposed to every 15 or 20 minutes. In addition, however, in not a single case is a pulse detected with sampling done every five minutes that is not contiguous to or contained within a major secretory episode, which would have been identified by sampling done every 20 minutes. Mean GH interpulse interval is 68 minutes with sampling every five minutes as opposed to 250 minutes with sampling every 20 minutes. With less

frequent sampling there is a progressive loss of identification of high-frequency, low-amplitude GH pulses.

Evans W, Faria A, Christiansen E, et al. *Am J Physiol* 1987; 252:E549-556.

Editor's comment—This group has previously utilized its computer-based pulse detection

algorithm to describe the secretion of luteinizing hormone. The results of this study suggest that sampling every 15 to 20 minutes is optimal to detect major episodes of GH secretion, but that more intensive sampling is needed to enumerate the high-frequency GH pulsations within major secretory episodes. The physiologic and pathophysiologic significance of frequent sampling applied to sub-

jects with growth retardation, acromegaly, protein-calorie malnutrition, and diabetes mellitus where GH secretion is abnormal remains to be shown. It is reassuring, however, that sampling every 20 minutes would appear to detect the major episodes of GH secretion and that more intensive sampling may not be required to identify most individuals with GH neurosecretory defects.
