The gingival vein as a minimally traumatic site for multiple blood sampling in guinea pigs and hamsters

Abstract

Laboratory animals are still necessary in scientific investigation and vaccine testing, but while novel methodological approaches are not available for their replacement, the search for new, humane, easy, and painless methods is necessary to diminish their stress and pain. When multiple blood samples are to be collected from hamsters and guinea pigs, the number of available venipuncture sites—which are greatly diminished in these species in comparison with other rodents due to the absence of a long tail—harasses animal caregivers and researchers. Thus, this study aimed to evaluate if gingival vein puncture could be used as an additional route to obtain multiple blood samples from anesthetized hamsters and guinea pigs in such a way that animal behavior, well-being or hematological parameters would not be altered. Thus, twelve anesthetized Syrian golden hamsters and English guinea pigs were randomly allocated in two groups: a control group, whose blood samples were not collected, and an experimental group in which blood samples (200 microliters) were collected by gingival vein puncture at weekly intervals over six weeks. Clinical assessment, body weight gain and complete blood cell count were evaluated weekly, and control and experimental animals were euthanized at week seven, when the mentolabial region was processed to histological analyses. Multiple blood sampling from the gingival vein evoked no clinical manifestations or alteration in the behavioral repertoire, nor a statistically significant difference in weight gain in both species. Guinea pigs showed no alteration in red blood cell, leukocyte or platelet parameters over time. Hamsters developed a characteristic pattern of age-related physiological changes, which were considered normal. Histological analyses showed no difference in morphological structures in the interdental gingiva, confirming that multiple blood sampling is barely traumatic. Thus, these results evidence that blood collection from multiple gingival vein puncture is minimally invasive and traumatic to hamsters and guinea pigs, and that it can be accomplished during at least six weeks.

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