Letters To The Editor

Commentary on Viewpoint “Human experimentation: No accurate, quantitative data?”

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To the Editor: In his Viewpoint documenting the value of human experimentation for understanding cardiovascular function, Rowell (4) points out the limitations and dangers of extrapolating cardiovascular responses from animals, mainly from cats and dogs, to humans. Rowell also emphasizes the quantitative nature of current techniques for human research. Frequently, new insights into exercise, orthostasis, health, and disease are made in tall, cooperative, ambulatory species such as ourselves compared with anesthetized or stressed animals. Experimentalists are wise to choose the best animal model possible to test a given hypothesis and often a comparative approach is powerful (5). For orthostasis, cardiovascular systems of humans and other tall terrestrial animals have evolved and adapted to the gravity of Earth over millions of years. In general, cardiovascular adaptations are more pronounced in terrestrial species with greater height and thus greater gradients of blood pressure between their heart, head, and feet. For example, giraffes (1) and tree-climbing snakes (2) have evolved mechanisms to provide adequate blood flow to their brains, while restricting blood flow and tissue swelling in dependent tissues. These anatomical and functional adaptations are not present in aquatic snakes, which succumb quickly to the effects of gravity when placed head over tail (3). Therefore, the gravity of cardiovascular adaptations can be appreciated more in ourselves, tall giraffes, and long snakes than in animals of short stature. Because humans are relatively tall compared with common laboratory animals, we can benefit greatly by studies of our own cardiovascular mechanisms during upright posture and exercise.

REFERENCES


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