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Medical Education Supplement

Newer practicals for undergraduate and postgraduate in the field of Physiology and Pharmacology

Animal experiments have always been an integral part of understanding physiological mechanisms and functions. Dissection and handling of tissues and performing various experimental set-ups and doing actual recording on live tissue excites the students and gives better insight to the principles demonstrated. Traditionally the Department of Physiology has been performing experiments on frog for undergraduate students since inception of medical education. These practicals on various aspects of nerve-muscle physiology have been part of the undergraduate teaching. There has been shifting towards environment friendly protection for animal experiments over the years. In the past couple of years, it was deliberated in the departmental meeting of teaching staff, to explore options other than frog-nerve muscle preparation for demonstrating the concepts of nerve-muscle physiology. Subsequently, as the supply of frogs by the animal-vendors dwindled and eventually stopped, the above process gathered momentum. The head of the department, Prof K K Deepak called for innovative ideas from the teaching staff to replace the frog practicals which could fulfil the objectives. This was unanimously supported by entire faculty of the department.

After concept presentation in the departmental meeting of teaching staff, few of the ideas were given a go ahead for pilot study. Small teams of resident-volunteers were made, alongwith one or more faculty members. After obtaining appropriate clearance from the Institute Ethics and Animal Ethics committees, the experiments were performed. Dr. Deepak spear-headed the progress of the individual groups continuously. With persistent efforts, the experimental setup and observations were standardised to be consistent and reproducible. The observations and the graphs were subsequently presented and validated by the faculty and teaching staff of the department. Feedbacks were received and incorporated as per technical feasibility.

The department has developed and standardized an in-situ rat soleus muscle-sciatic nerve model to demonstrate the phenomenon of nerve muscle properties like simple muscle twitch, effect of strength of stimulus, effect of two successive stimuli and tetanus.

We have also designed a simple and feasible method to demonstrate the effect of increasing strength of stimuli, two successive stimuli and tetanic stimuli on human finger muscle twitch response.

For the benefit of the medical teaching community world over, we have carefully documented and their issues present six experiments for undergraduate medical education.

We are convinced that the following experiments are an effective addition in the undergraduate practical for demonstrating the concepts of nerve-muscle physiology.

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