Discovery of Muscle Relaxant Curare

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In 1807 F.H.Alexander von Humboldt, German naturalist and A.Bobpland published Voyage aux Regions Equinoixales du Nouveau Continent. This contained a description of the manufacture of curare by the Indians in Venezuela. It became known that the arrow poison (then spelled also woorara and urari) paralysed the animals, shot with it. Samples of curare were brought to Europe and Alexander von Humboldt is said to have experimented with it on the nerves of frogs. However his results were inconclusive.

Claude Bernard acquired his doctorate in medicine in 1843, and the following year began researches into the actions of curare. He performed the classical experiments on frog nerve-muscle preparations and reported on these in 1850. The antagonistic action of curare on the convulsive effect of strychnine poisoning captured his interest. In 1857 he reported definitively that the site of action of curare was at the peripheral end of the motor nerve – now called the neuro-muscular junction.

In 1934 Howard Florey, then working in Sheffield, used curare to control tetanus spasms in rabbits and ventilated them by a tank ventilator; these experiments probably stimulated further trials of curare in humans by Cole and West. His paper, co-authored by Harding and Fieldes, was published in the Lancet (Florey was to achieve fame in 1945 when he shared a Nobel prize with Fleming and Chain for work on penicillin).

The main problem with curare at this time was that preparations were impure. However, in 1939 a biologically standardized preparation of the active principle d-tubocurarine, obtained from the plant Chondrodendron tomentosum, was introduced under the name “Intocostrin”.

Harold R Griffith (1894-1985) was born in Montreal and graduated from McGill University. He and his resident Dr Enid Johnson on January 23, 1942 used curare for the first time during anaesthesia to produce muscle relaxation. He understood the problems with curare and while others would try it in a laboratory and abandon it, he with wisdom and courage used it in the operating room and demonstrated it to be safe. Historians may refer to anaesthesia as “before and after Griffith”. The introduction of muscle relaxants reduced anaesthetic requirements, increased the scope of surgery, improved operating conditions and decreased morbidity and probably mortality. In 1922 while still a medical student, he emphasized the importance of observing and charting vital signs and assisting respiration if it appeared to be inadequate. Dr Griffith established the first recovery room in Canada in 1943 and an intensive care unit in 1961.