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THE THERAPEUTICS OF ARECOLINE

by

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The Therapeutics of Arecoline.

Arecoline ($C_8H_{13}NO$) is the alkaloid or active principle of Areco catechu. Arecoline Hydrobromate ($C_8H_{13}NO \cdot HBr$), the only preparation used in medicine, occurs in white crystals and is very soluble in water and alcohol. It is a diaphoretic, diuretic, sialogogue and cathartic. Its action is quick and sure and it should be used in all cases where a rapid evacuation of the alimentary canal is desired. It can be administered either intravenously or hypodermically and is followed by profuse ptyalism, enormous increase of intestinal secretions and increased peristalsis. This is usually followed by flatus and evacuations of the alimentary canal. Hypodermic injections of Arecoline are often followed by nausea and increased intestinal pains which gradually subside but which may be overcome or prevented altogether by the administration of cannabis indica, previous to the injection.

The following are a few of the cases in which I have noted the action of the drug:

Case No. 1.

A family horse, seventeen years old, in good flesh, weight about 1000 lbs. Used only for light work. The owner found the animal loose in the morning and in a patch of alfalfa. The animal came to the hospital about 9:00 o'clock. Temperature 101, pulse 64 and weak. He could only breathe with difficulty. Was badly bloated and in great pain. Looked at first as if the animal would require the use of the trocar. At 9:10 I gave an ounce of Eucalyptolin in a capsule and half a grain of Arecoline hypodermically. In from five to ten minutes there was a free passage of flatus and a small amount of feces. At 10:10 another half grain of Arecoline was administered with a large passage of flatus and feces. All the time there was profuse ptyalism.

At 11:00 o'clock the animal walked apparently without pain and at 12:00 o'clock would eat grain if allowed. The animal returned home about 3:30 P.M. and to all appearances was as well as ever.

Case No. 2.

A bay gelding, ten years old, had eaten about a bushel of new oats and had no movement of the bowels to speak of since. He had had the oats about fifteen hours when he was brought to the hospital. Patient was in dull pain and uneasy but not violent, nor had he been violent at any time. Respiration 20, pulse 60 and strong. At 1:00 o'clock I gave one-half grain of Arecoline and at 1:05 there was profuse ptolism and a small amount of flatus. At 1:15 the borborygmus which was very slight at the beginning had increased until it could be distinctly heard. At 1:25 a half dozen large balls of feces were passed. All the time there was some flatus being passed. At 2:00 o'clock one grain of Arecolin was given, also one ounce of Eucalyptolin in a capsule. At 2:15 the patient had a free passage of the bowels. A large amount of partly digested oats passed through the animal and he was able to return home the next day. All the dullness had passed away and the animal was able to go to work.

Case No. 3.

I was called to see an animal that had been choked on oats. He had been choked about three quarters of an hour. Gave one-half grain of Arecoline hypodermically. In seven minutes the saliva was flowing freely and by a little manipulation of the throat the animal became allright and in an hour was eating grass.

Case No. 4

Was called to see a case of Potchial fever, following strangles. It was a very light case and I decided to give Arecoline to get the secretory organs to working and then depend upon food and nursing to bring the patient out allright.

I gave one-half grain of Arecoline and advised alfalfa and moderate exercise. The mare made a good recovery.

Case No. 5.

A gray gelding, ten years old, was taken with an attack of azoturia. The animal had been standing in the stable for three days and on full feed. When taken out, went suddenly lame after traveling about 300 yards and it was with some difficulty that he could be returned to the stable.

Treatment---One aloes ball and one grain of Arecoline given in one-half grain doses about an hour apart. The urine was also drawn and the patient was given an alcohol bath. The horse was apparently all right the next morning.

Case No. 6.

A bay gelding, 20 years old, had been fed the night before on green corn. Was called at 8:30 A.M., and found the animal restless, rolling, pawing, striking and showing other characteristic symptoms of flatulant colic. Temperature 102, respiration 20.

Treatment---At 8:30 the animal was given one-half grain of Arecoline, hypodermically. At 9:10 another one-half grain was administered. At this time there was a passage of soft feces and at 9:15 another passage. At 9:30 one grain of Arecoline was given and there were several more passages of feces accompanied by flatus. At 10:15 A.M. temperature 102, pulse 39, and respiration 24. At 10:20 another one-half grain dose of Arecoline was given followed by the expulsion of considerable flatus and profuse salivation. At 11:45 expulsions of flatus and a small amount of soft foeted manure. At 12:25 I gave another one grain dose of Arecoline. The patient by now had small passages of feces at short intervals. At 12:35 the treatment was changed. The patient getting four drams of cannabis indica and one ounce of Eucalyptolin. At 2:25 Cannabis Indica 2 drams and Aromatic Spirits of Ammonia 4 drams. At 2:50 Arecoline was again administered in a one grain dose. The action of the

Cannabis Indica was pronounced. At 4:30 the patient was very much improved and at 9:00 P.M. he was discharged as cured.

Case No. 7.

We were called to see an animal about six miles from the hospital and upon arriving at the farm found the animal suffering from flatulent colic. This was about 9:00 P.M. The animal showed violent symptoms. The abdomen in the region of the caecum was tympanitic and the vermicular motion of the intestines seemed to be entirely suspended. I immediately gave the animal a grain dose of Arecoline hypodermically to stimulate the secretions of the alimentary tract and also to start up peristalsis. We then gave three ounces of Eucalyptolin to allay any further fermentation in the stomach. Five minutes after the administration of the Arecoline a profuse salivation was observed. Twenty minutes after the first hypodermic injection we gave another one grain dose of Arecoline in the same manner. At this time there was some borborygmus noticed, and the animal began to prespire freely. There was a blanket applied to lessen the danger of the animal taking cold. Twenty minutes after the second hypodermic injection we gave another one grain dose of Arecoline, making three grains in all. The animal began passing flatus at this time and in a short time was considerably relieved. We then gave the animal an ounce of Aromatic Spirits of Ammonia, and an aloes ball. When we left the animal at 10:30 P.M., he was resting quietly and the owner reported later that the animal made a complete recovery.

Case No. 8.

I was called to see a big bay mare, weighing 1700 pounds and 16 years old.

History---The owner found her sick, with colicky pains, when he went to feed her in the morning. I arrived at 9:00 o'clock and diagnosed the case "Impaction of the Colon". The animal had had the usual ration of alfalfa, corn chop and bran.

Treatment---I gave one and one-half grains of Arecoline which produced a profuse salivation in seven minutes, also slight paristalsis but no passage of feces nor any apparent movement of the impacted mass. The dose of one and one-half grain of Arecoline was repeated in an hour with the same results as before. In another hour a warm rectal injection was given, also a purgative consisting of six drams of aloes and 2 drams of calomel. A little later I gave a quart of raw-linseed oil, containing one ounce each of Aromatic spirits of Ammonia and Eucalyptolin. By the next morning the animal had had three large passages and was ready for her breakfast.

Case No. 9.

I was called to see a case of colic in a bay mare, eight years old. The animal had gorged herself on alfalfa during the day, not being accustomed to it, and about 8:00 o'clock she began to show signs of colic. I arrived about 10:30 and found the animal in considerable pain, pulse slow and extremities cold. Temperature 102, no paristalsis. Rectal exploration revealed no impaction. I administered one grain of Arecoline and in five minutes noticed salivation. In thirty minutes had a small passage of feces. She had four more passages with in the next fifteen minutes. In an hour I gave one ounce of Eucalyptolin and four drams of Nux Vomica. The animal was much improved by morning and was ready for feed by noon the next day.

Case No. 10.

Called to see an animal with a severe attack of flatulent colic, animal rooling and extremely reckless, passing a small amount of flatus and occasionally a little soft feces.

Treatment---Two ounces of Eucalyptolin in capsules and in one-half grain doses one hour apart. All the tympany had by this time passed away and the patient was given an aloes ball and two ounces of Aromatic Spirits of Ammonia and discharged.

Case No. 11

A sorrel mare, four years old, came to the hospital. The owner found her loose and she had eaten about two pecks of corn chop. There were no symptoms of any kind so the case was diagnosed as engorgement. At 2:05 P.M. the patient was given one half grain of Arecoline and four drams of aloes. This was followed by profuse salivation and in forty-five minutes was followed by a normal passage of feces. No further treatment was given until the next day when one and one-half grains of pylocarpine was given. The next day the animal was discharged in good condition.

Forage Poisoning cured by Arecoline as reported by
C.G. Saunders, V.S., Toronto, Ontario, Canada, in the
American Veterinary Review, Vol. XXXI, No. 4, Page 497.

On Sunday, May 19, 1907, at 8 P.M., I was called to attend a horse belonging to a potato dealer. Upon examination I found the horse, an aged gelding, standing with his head jammed in the corner formed by the side of the stall and the hay rack, pulse small and weak, temperature normal. The animal was unable to back up and when pushed over in the stall appeared to have lost all coordination in his movements. Anorexia was complete, but thirst appeared excessive, although there was complete inability to drink. The pupils were dilated and the breathing stertorous. Peristalsis was entirely suspended, the horse having passed no faeces since the night before. There were slight muscular tremors over the crural muscles. Urination and urine normal.

Upon inquiry I learned that he had been fed a quantity of half rotten potatoes during the previous week. But had showed no signs of illness until that morning (Sunday) when he refused his food. I also found the hay musty and of a poor quality. I diagnosed the case as encephalitis caused by faulty food stuff. Prognosis unfavorable.

Treatment---Hypodermic of strychnine sulph. grains 1, rectal injection of warm water. I called again on Monday morning and found little alteration, except that the pulse was stronger and that the bowels had moved. I then administered Arecoline Hydrobromate grain $\frac{1}{2}$. Action began in seven minutes. Profuse salivation and sweating and in fifteen minutes the bowels were copiously relieved. Altogether three movements took place, the faeces being offensive and black in color. In half an hour action had ceased, the animal appeared brighter, the pupils less dilated and the breathing quieter. I saw him again in the afternoon when he drank half a pail of water, eyes normal and general appearance much improved. I again gave strychnine sulph. grain 1, ordered a pail of water to be left with him and a hand full of grass to be given in the evening if he would eat it. The next morning he was apparently as well as ever and ate his morning feed with avidity. I left powders of nux vomica and ferri sulphate to be given three times a day, and requested owner to report. The horse went back to work the next Thursday and has worked ever since and has a good appetite and is improving in condition.

Arecoline compared with Eserine in the
treatment of Equine Colics as reported by
W.H. Weathers, Watseca, Ill.

I have selected this subject not for the purpose of introducing anything new in the treatment of colics, neither is it my intention of adding anything new to the therapeutics of eserine and arecoline, but for the want of a better title for a review of my experience with the use of these agents in the treatment of impaction of the bowels and intestinal flatulence. I have given to my paper the above appellation.

"Hearing and reading somany very gratifying reports from practitioners on the use of eserine in bowel affliction, I went to the field very much pleased that such a quick cathartic could be employed in these cases. I therefore

promptly began the use of eserine and my first case was a brown draft mare, eight years old, weighing about 1600 pounds. I was called January 7th, 1906, and found her presenting signs of impaction of the bowels. I saw her about 9:00 o'clock A.M. The owner said he found her sick when he arose that morning. I gave her one grain of eserine salicylate subcutaneously.

In about five minutes she became uneasy, straining considerably, and going through the usual performance when eserine is given with the exception that no flatus or faeces were passed. After about one hour the effect of the drug subsided and she was about the same as when I had found her. No peristalsis was perceptible. Raw-linseed oil, carbonate of ammonia and nux vomica were administered when a second dose of eserine was administered, this time one and one-half grains by the tracheae. I got the same results as before--a violent shaking up of the muscular system, but no passage. I went on with the oil and stimulant treatment but could get no peristaltic action.

The mare died about forty-eight hours after I found her and post-mortem examination revealed a pretty severe case of impaction of the colon, but did not seem worse than an average case. This was typical of the cases of digestive derangement in which I tried eserine. It utterly failed in every case in which I employed it and I used it for at least a dozen cases in succession and lost all of them. Most of the cases were those of impaction but some were of intestinal flatulence.

My first trial of Arecoline was with a gray Western gelding, 9 years old, and weighing about 1300 pounds. I had treated this horse before and knew he was very hard to drench, being one of the worst Western kind; so I gave one grain of Arecoline subcutaneously, and in about three to five minutes salivation began, followed by straining and uneasiness. He was taken out into the yard, where he rolled considerably, passing faeces several times and flatus almost continually. In about forty-five minutes all tympany had disappeared and he was as gaunt as if he had been driven on a hard drive.

Another case was that of a roadster gelding, ten years old, weighing about 1100 pounds. He had been driven twenty miles, and had refused food on arriving at the end of the journey. I was called about 11:00 A.M., but could not see him until 5:00 P.M. Found him uneasy, with some tympany but very little; pain of a sub-acute character. It looked to me like an all night case. I administered one grain of Arecoline sub-cutaneously, and gave an injection of glycerine. The drug acted promptly, and he passed faeces three or four times, some gas and in less than an hour I was on my way home.

A bay mare, 11 years old, weighing about 1400 pounds, seemed to be suffering with impaction of the bowels. The owner said she had been running on corn stalks and had been sick three days. She had been given about three pints of raw-linseed oil when I saw her. At 2:00 P.M. I gave her one grain of Arecoline and got some faeces promptly and quite a little peristalsis. I followed with stimulating treatment and the animal recovered in a few days."

After having noted the action of Arecoline on a large number of other cases besides the ones reported and having learned from the Clinician in charge at the Hospital that Arecoline has been used on at least fifty cases of different kinds in the last year without once failing in its action, I have come to the conclusion that it is very reliable.

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