

Treatment of *Taenia saginata* Infection with Mixture of Areca Nuts and Pumpkin Seeds

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In January and February 1974, 32 adults (20 males and 12 females) and a 13-year-old girl with taeniasis saginata were treated with the mixture of boiled areca nuts and pumpkin seeds at Mastoban, Jen-ai District, Nan-tou County, Taiwan. A total of 48 worms including 42 scolices were recovered from 29 cases. Side-effects were observed in 4 cases including 3 with complaints of dizziness, tinnitus, nausea and vomiting, and one with coma and abdominal pain. Mixtures of 75-150 g areca nuts and 50-100 g pumpkin seeds were judged effective and safe.

Taeniasis saginata is one of the most common infections among the aborigines in mountainous areas of Taiwan. Infection rates have been recorded 6-37%^(1-3,6,10,13-14,16,22,24,27,29) and anthelmintic drugs such as atabrine^(6,11,15), bephenium hydroxy-naphthoate⁽¹¹⁾, bithionol⁽²⁵⁾, various dichlorophen⁽¹¹⁾ and Yomesan⁽¹⁵⁾ have been used for treatment in Taiwan with different degrees of efficacy and side-effects. Areca nuts and pumpkin seeds have been used as anthelmintics in mainland China for more than 1,000 years. The people in Chekiang Province commonly used areca nuts to treat *Fasciolopsis buski* infections with satisfactory results^(23,26). We confirmed the above findings in the treatment of fasciolopsiasis among school children with the mixture of areca nuts and pumpkin seeds in southern Taiwan.⁽⁹⁾ The present study attempts to prove the therapeutic effect of areca nuts and pumpkin seeds for the treatment of taeniasis saginata at Mastoban, Jen-ai District, Nan-tou County, Taiwan.

MATERIALS AND METHODS

The formula of areca nuts and pumpkin seeds which were bought from a herbalist shop and a vegetable seed shop are given in Table 1. Specified amounts of areca nuts and pumpkin

Table 1. Formula of areca nuts and pumpkin seeds

Group	No. of cases treated	Formula		
		Areca Nuts (g)	Pumpkin Seeds (g)	Water (ml)
1	2	75	50	1,500
2	5	100	80	1,500
3	20	120	100	1,500
4	4	150	100	1,500
5	2	200	100	1,500

seeds were put into 2-1 beaker containing 1,000 ml of tap water, and the mixture was boiled to 1/4-1/3 of its original volume. Five hundred ml of tap water were added and the mixture was boiled again until 250 ml of mixture extract remained.

Thirty-three patients, including 20 male and 12 female adults and one 13-year-old girl, after fasting overnight were each treated with 250 ml of the mixture extract. Two hr later 15 g magnesium sulfate were given as a purgative aid, and stool samples were collected for examination. Two to 3 months later the patients were given a course of atabrine to check the results.

RESULTS

Stool samples were collected from 29 cases and a total of 48 worms was recovered. No stools were submitted from 4 patients (2 in Group 3, 1 each in Groups 4 and 5), because 3 had vomiting, and 1 became comatose. No differences in worm reductions were observed among the 5 groups (Table 2). Thus the smallest dose (Group 1) was considered most appropriate for treatment of *Taenia saginata* infection. When all the cases were treated 2-3 months later, with a course of atabrine, no worms or segments of worms were found.

Table 2. Relationship between dosage and effect

Dose (group)	No. of cases			No. of expelled	
	Treated	Examined	expelling Worms	Worms	Scolices
1	2	2	2	2	2
2	5	5	5	14	8
3	20	18	18	27	27
4	4	3	3	4	4
5	2	1	1	1	1
Total	33	29	29	48	42

Out of 48 worms, 42 were complete with scolex. We suspect that scolices of the other 6 tapeworms were lost after deworming, because the worms were covered with sawdust when brought to us.

After treatment, 20 patients each passed one worm, 6 patients passed 2 worms, and 2 patients each passed 3 worms. From one patient 10 worms were recovered.

Table 3. Relationship of dosage and side-effect

Dosage (group)	Patients		Tinnitus	Nausea	Vomiting	Abdominal pain	Dizziness	Coma
	No. of treated	Side-effect present						
1	2	—	—	—	—	—	—	—
2	5	—	—	—	—	—	—	—
3	20	2	1	2	2	—	2	—
4	4	1	1	1	1	1	1	—
5	2	1	1	—	—	—	1	1
Total	33	4	3	3	3	1	4	1

As shown in Table 3, only 4 out of 33 patients showed side effects and the main complaints were dizziness, tinnitus, nausea and vomiting. Coma and mild abdominal pain were observed once. The comatose patient (Group 5) began to suffer dizziness, tinnitus and weakness one half hr after taking a dose of 200 g areca nuts and 100 g pumpkin seeds. One hr later he fell into hypotension which led to coma. The patient still showing signs of weakness, immediately awoke up after intravenous injection of 500 ml normal saline. He recovered quickly after taking 300 ml sugar solution and having a rest.

DISCUSSION

In Chen's⁽⁴⁾ collection of herb prescriptions for Mainland China, he suggested that areca nuts and pumpkin seeds have a therapeutic effect on tapeworms. Ding⁽⁹⁾ agreed with Chen's opinion. Wang⁽²⁶⁾ used areca juice to expell *Taenia saginata* and obtained a cure rate of 47.2%. The present study using a mixture of areca nuts and pumpkin seeds to treat the infections of the same tapeworm, gave a cure rate of 100% (29/29). While the scolex recovery rate was 87.5% (42/48). These results suggest that a mixture of areca nuts and pumpkin seeds is more effective than areca nuts alone.

Chiu⁽⁵⁾ demonstrated that areca nuts contains the arecoline, which can stimulate the parasympathetic system and cause hypotension, bradycardia, nausea, vomiting, weakness and syncope. In the present study, such effects were seen in 4 subjects. One patient reacted severely and became comatose. This patient had been given 200 g of areca nuts which was perhaps an overdose. According to our experience, mixtures of 75-150 g areca nuts and 50-100 g pumpkin seeds, seems effective and safe.

In 1973, Chung⁽⁷⁾ used 150 g of pure areca nuts to treat 8 cases of taeniasis saginata. Two of them showed a transient syncope. While no side-effects were noted with pumpkin seeds treatment only segments without scolices were expelled. Apparently pumpkin seeds can augment the effect of areca nuts and decrease the parasympathetic stimulating effect.

In this experiment, there were 2 cases in which the expelled worms were entangled in 4 cm knot making expulsion difficult. A dose of magnesium sulfate was necessary to expell the worms.

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檳榔和南瓜子之混合煎劑對於 無鈎條蟲病之療效

臺北醫學院寄生蟲學科

鍾文政 柯宗甫

(65年5月7日受理)

著者等曾於1974年1~2月間，在南投縣仁愛鄉瑞岩，以檳榔南瓜子之混合煎劑治療32名成人（男20名，女12名）和一位13歲女孩的無鈎條蟲病患者。從所收回的29個檢體中，共獲得48條蟲體，其中42條具有頭節，所以其頭節尋獲率為87.5% (42/48)。在2~3個月後，患者一律投給瘧滌平 (atabrine)，但是未能找到蟲體或節片，由此可證明治癒率高達100% (29/29)。除了三名顯示出輕微而可忍受的副作用，如頭暈、耳鳴、噁心，嘔吐及一名呈現昏迷外，一般言之，並無嚴重的副作用出現。由這次治療結果中，顯示出75~150克檳榔和50~100克南瓜子之混合煎劑的藥量為有效而且安全。