TAENIASIS IN INDONESIA WITH SPECIAL REFERENCE TO SAMOSIR ISLAND, NORTH SUMATRA

AA Depary and ML Kosman

Department of Parasitology, Faculty of Medicine, University of North Sumatra, Medan, Indonesia.

Abstract. In Indonesia, taeniasis is endemic on the islands of Bali, Irian Jaya and Sumatra. The Balinese eat pork or beef raw in a dish called "lawar". Natives of Irian Jaya also have a custom of preparing and consuming raw pork. On Samosir Island in North Sumatra, undercooked pork is consumed in traditional ceremonies.

In Bali, the local people defecate into cages (called "teba") of domestic animals. In Irian Jaya, pigs are allowed to feed on human feces inside houses at night. The natives of Samosir Island defecate in their gardens and their feces are easily consumed by freely roaming pigs.

Since 1972, studies have been carried out on the epidemiology of taeniasis in North Sumatra. The Taenia sp. found on Samosir Island is morphologically identical to Taenia saginata. However, the local people seldom or never consume beef because it is very expensive, while pork is commonly consumed. The species and the natural intermediate hosts of Taenia sp. on Samosir Island are still under investigation.

INTRODUCTION

Taeniasis is found worldwide. The prevalence of taeniasis depends upon frequency of consumption of raw or undercooked pork or beef and the level of sanitation in various regions.

Taeniasis (Taenia saginata or Taenia solium) is endemic to Indonesia, Taiwan, Korea, China, Thailand, the Philippines and other countries in Southeast Asia.

Taenia saginata in Asia is somewhat of an enigma (Huang et al., 1966; Chung and Liu, 1970; Kosin et al., 1972; Cross, 1987; Fan et al., 1988) because in Taiwan, Korea, Indonesia and the Philippines people frequently eat raw or undercooked pork, but rarely eat beef.

In some endemic areas, both species of Taenia can be found. Taeniasis and cysticercosis are endemic in areas where raw pork or beef is consumed and where sanitation is poor. Food and water are easily contaminated under these conditions.

In Cheju Island, Korea, and in the northern part of China, pigs are reared in the toilets for preparing artificial fertilizer (Fan, 1988, personal communication), and taeniasis and cysticercosis are commonly found in humans (Soh, 1966).

TAENIASIS IN INDONESIA

The first report of taeniasis saginata in Indonesia was made by Luchtmans in 1867 in Netherlanders in Malang, East Java. In 1940, Bonne found one case of taeniasis solium in a Chinese woman from Samarinda, Borneo (Hadidjaja, 1971). Today, taeniasis is endemic in Indonesia on the islands of Bali, Irian Jaya, Sumatra and Timor (Table 1).

Balinese prepare a special dish containing raw or undercooked pork or beef, called "lawar". The people usually defecate on the ground or in stables ("teba") of domestic animals located behind their houses (Koesharjono et al., 1987; Warudju, 1988).

Taeniasis solium is endemic to the mountainous areas of Irian Jaya (Tumada and Margono, 1973; Subianto et al., 1978; Tjahjadi et al., 1978). At least 9 percent of the population in the Paniai Highlands suffers from taeniasis (Tumada and Margono, 1973). The existence of taeniasis solium and cysticercosis among the natives of these highlands is closely related to their ceremonial customs of preparing and consuming raw and undercooked pork and the very poor sanitary conditions in their homes. The inhabitants of these mountainous areas "cook" pork with
FOOD-BORNE PARASITIC ZOONOSIS

Table 1
Religion and food habits in endemic areas of taeniasis in Indonesia.

<table>
<thead>
<tr>
<th>Endemic areas</th>
<th>Religion</th>
<th>Animal foodstuff</th>
<th>Taenia sp. reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samosir</td>
<td>Christian</td>
<td>pig, dog, goat,</td>
<td>T. saginata ?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cattle (rare)</td>
<td>T. solium (rare)</td>
</tr>
<tr>
<td>Bali</td>
<td>Hinduism</td>
<td>pig, goat, cattle</td>
<td>T. saginata</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>T. solium</td>
</tr>
<tr>
<td>Irian Jaya</td>
<td>Animism</td>
<td>pig</td>
<td>T. solium</td>
</tr>
<tr>
<td>Timor</td>
<td>R Catholic</td>
<td>pig, goat, cattle</td>
<td>no report</td>
</tr>
</tbody>
</table>

Cassava and its leaves by heating it with hot stones. As a result, the pork is undercooked (Margono, 1989).

In the highlands of Irian Jaya, pigs are reared in people’s dwellings so that during the night they can eat human feces. This unsanitary habit, however, can result in cysticercosis in pigs (Vriend, 1979) and in humans by heteroinfection.

In North Sumatra, T. saginata and T. solium have been reported (Kwo, 1970; Hadidjaja, 1971) among the Bataks who live mainly on Samosir Island and in the Karo highlands.

TAENIASIS IN SAMOSIR ISLAND

Samosir Island is in the middle of Lake Toba in North Sumatra. The northern part of the island, known for its beautiful panoramic views, is popular with tourists. The island is 900 m above sea level and relatively cold and humid. The population of 100,000 people are farmers and fishermen.

Taeniasis on Samosir Island resembles taeniasis in Lanyu Island (Fan, 1988, personal communication). In Samosir Island, the local people usually defecate on the ground of their gardens and their compounds (Koesharjono, 1987); they also consume undercooked meats of many animals. Taeniasis, called “adeon”, is a well known worm infestation among the local inhabitants.

Kosin et al (1972) reported a 9.5% rate of Taenia infections in inhabitants of the village of Ambarita on Samosir Island. Following treatment, adult worms expelled from 65 patients were morphologically identical with classical Taenia saginata (Table 2). When questioned, however, residents of Ambarita reported that they rarely or never consumed beef because it was very expensive. People preferred to eat pork, dog, sheep or goat meat. Since then, Kosin et al (1972) have attempted to identify the species of Taenia and its intermediate hosts on Samosir Island. Taeniasis was also found in other parts of Samosir Island (Depary, 1977).

Fan et al (1988) reported 15 cases of taeniasis on Samosir Island. Fourteen people admitted eating undercooked pork and dog meat and only one admitted eating beef. All tapeworms recovered from these cases were morphologically similar to T. saginata. Cross (1987) suggested that goats might be one of the natural intermediate hosts of Taenia sp. in North Sumatra; however, his suggestion has not been investigated.

The species of Taenia and its natural intermediate hosts on Samosir Island still need further investigation. The Samosir Island taenid may be classical T. saginata using cows or water buffalo as intermediate hosts; however, Fan et al (1988) reported that cysticerci failed to develop in Holstein calves fed Samosir Taenia eggs. On the other hand,
Table 2

Taeniasis surveys in Samosir Island, North Sumatra Indonesia.

<table>
<thead>
<tr>
<th>Year</th>
<th>Prevalence rate</th>
<th>No. treated cases</th>
<th>No. worms collected (worm/patient)</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>9.5%</td>
<td>65</td>
<td>93 (1-7)</td>
<td>T. saginata</td>
</tr>
<tr>
<td>1986</td>
<td>21%</td>
<td>10</td>
<td>23 (1-9)</td>
<td>T. saginata</td>
</tr>
<tr>
<td>1987</td>
<td>17.3%</td>
<td>42</td>
<td>56 (1-4)</td>
<td>T. saginata</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T. solium</td>
</tr>
</tbody>
</table>

the Samosir Taenia may be a new strain of T. saginata that has become adapted to developing viable cysticerci in domesticated wild pigs on Samosir Island in North Sumatra.

REFERENCES


