A Study on Intestinal Helminthic Infection of a Rural Community in Bali

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ABSTRAK

Susanto, Maestrali, & J. J. C. C. - Studi tentang infeksi cacing pada populasi masyarakat desa di Bali.

Penyakit infeksi cacing adalah masalah yang seringkali ditemui dalam masyarakat yang mendiami wilayah wilayah tropis dan sub-tropis. Pelaku cacing yang seringkali menjadi sumber masalah adalah jenis cacing yang menginfeksi manusia dan hewan.

Penelitian ini dilakukan dengan menggunakan metode survei epidemiologi di desa di Bali. Penelitian ini diharapkan dapat memberikan informasi yang bermanfaat bagi pihak-pihak yang terkait.

Key Words: soil transmitted helminthiasis - Kako thick smear method - Tricho- ascariasis - periodic lumbar - immunization

INTRODUCTION

Much effort in recent years have been devoted to emphasizing the realization that rural health problems tend to effect the complex, multifaceted interaction of many socio-cultural and environmental variables. Specialism in a given academic or medical field have found that the dimension and causal factors of rural health problems cut across the spectrum of arbitrarily defined department boundaries, and thus represent inter-disciplinary phenomena in the true sense of the word.

The humidity and the temperature which are suitable to parasitic development, their parasitism and importance are factors leading to the high prevalence in many places. On the other hand, the magnitude of incidence rate illustrates the existing sanitation of that community.

Soil-transmitted helminthiasis are considered to be the common parasites with very close association with elements mentioned above. Ascaris, the giant round worm, causes the most prevalent infection of man with over billion cases throughout the world (Peters, 1976). Yet disability appears to be minor and death relatively rare (Hunter, 1976).
MATERIAL AND METHODS

The research site was the village located at latitude of 600 twenty in the southern foothills of Bali's largest and most sacred volcano, Gunung Agung. The village is divided into 18 banjars or hamlets. There are four inner banjars clustered in the center of the village, with the nine outer banjars radiating along north-south axes from the central cluster. The arable land of the village is almost evenly divided between irrigated and unirrigated paddy fields.

The center of the village contains the village office, schools, market, numerous small shops and food stalls, and a health and family planning clinic. There is no piped water in the village, this being carried in buckets from springs. There are also no latrines available. Health services are provided by a midwife and by numerous traditional practitioners, balians, who individually practice different specialties. There is a community health center staffed by a physician in the village to the east, but it is rarely patronized by residents of the study village due to the 10 kilometers round-trip distance involved.

The village population of 5000 inhabit 1600 households which are dependent upon different combinations of irrigated and dry land agriculture, animal husbandry, skilled and unskilled labor, and petty trading as an economic base.

The participants of this study originated from a random stratified sample of households drawn from three banjars. Ageing of children was accomplished by translating the Balinese calendar to a Gregorian system of 12 months, 365-day years. There being a direct and predictable relationship between the two calendrical systems.

Fresh stool samples were brought to the examination sites in previously distributed plastic containers. The samples were fixed in the field using the Kato thick smear method and examined a few hours later for qualitative and quantitative analysis. Kato method is considered to be a simple method of fecal examination, especially for the detection of Ascaris, Trichuris and hookworms.

RESULTS

The incidence of helminthic infection observed from the sample (TABLE 1) is consistent with the findings of Clarke et al. (1975) who report that in Indonesian population at large nearly 100% of the rural population is infected with one or more species of self-transmitted helminths. This high incidence showed can be linked to a variety of environmental and socio-cultural variables. Among these is the observation that the residents of the sample banjars exhibit a clustering, high density settlement pattern which is typical of many banjars throughout Bali. This peculiar trait has the effect of encouraging large number of people, many of whom are infected, to make use of a limited number of conveniently located irrigation ditches and gullies for personal disposal.

<table>
<thead>
<tr>
<th>Number of Parasite Species</th>
<th>Children Age</th>
<th>Children Age</th>
<th>Adult Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4-12 mos.</td>
<td>&gt; 10 mos.</td>
<td>(N=744)</td>
</tr>
<tr>
<td></td>
<td>(N=113)</td>
<td>(N=64)</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>0 (.89)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>One or more</td>
<td>6 (.51)</td>
<td>64 (.95)</td>
<td>74 (.80)</td>
</tr>
<tr>
<td>Two or more</td>
<td>1 (.08)</td>
<td>10 (.16)</td>
<td>10 (.14)</td>
</tr>
<tr>
<td>Three</td>
<td>0</td>
<td>4 (.06)</td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Parasite Species</th>
<th>Children Age</th>
<th>Children Age</th>
<th>Adult Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4-12 mos. (N=120)</td>
<td>&gt; 10 mos. (N=44)</td>
<td>(N=744)</td>
</tr>
<tr>
<td></td>
<td>Mild</td>
<td>Moderate</td>
<td>Library</td>
</tr>
<tr>
<td>Ascaris</td>
<td>0 (.06)</td>
<td>2 (.17)</td>
<td>24 (.29)</td>
</tr>
<tr>
<td>Trichuris</td>
<td>15</td>
<td>85</td>
<td>90</td>
</tr>
<tr>
<td>Trichinella</td>
<td>1 (.00)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hookworms</td>
<td>15</td>
<td>44</td>
<td>24</td>
</tr>
<tr>
<td>Taenia spp.</td>
<td>23</td>
<td>78</td>
<td>50</td>
</tr>
</tbody>
</table>

TABLE 2 presents an opportunity to examine the relative threat to health, based upon intensity of infection, which is posed by different helminthic species for the members of the sample. The species expected were the soil-transmitted worm andcestode. It is evident that infection with ascari presents the greatest threat to children as only three of the subjects in the age 1-5 cohort are free of infection with this parasite. Additionally, the majority of those who are infected are suffering from moderate or heavy infection, based on quantitative egg counts.

The information presented in TABLE 1 and TABLE 2 indicates that ascari infection presents the most significant threat to under-five children both in terms of incidence and intensity of infection. Elaborating upon this observation, TABLE 3 shows that among children residing in the outer banjaras, the prevalence rate of intestinal helminthic infection is lower or almost the same as inner banjaras in contrast to the better element available in the inner banjaras.

TABLE 3. — The prevalence of outer and inner banjaras sample in Bali suffering from helminthic infection, 1979.

<table>
<thead>
<tr>
<th>Parasite Species</th>
<th>Outer Banjar</th>
<th>Inner Banjar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascaris lumbricoides</td>
<td>87</td>
<td>100</td>
</tr>
<tr>
<td>Trichuris trichiura</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td>Hookworms</td>
<td>56</td>
<td>56</td>
</tr>
</tbody>
</table>

Soriano et al. 1969 Intestinal helminthic infection in Bali.
DISCUSSION

Soil-transmitted helminths, namely *Ascaris*, *Trichuris* and hookworm, seemed to dominate the prevalences in the study area and are known to cause the most common worm diseases in infancy. The infection occurs at single or mixed one. As shown in TABLE 1 starting at the age below one children are harbouring more than one species. As already recognized *Ascaris* infection was detected in under 12 months baby. Nokes & King (1972) reported mixed infection of *Ascaris*, *Trichuris* and hookworm in a 6 months baby. It confirms the possible occurrence of infection in under 12 months children. TABLE 1 shows that among the study group of up to 12 months 50% of children were not harbouring helminthic infection, but 10% of children above 12 months were having problem with helminthic infection.

The large difference in magnitude of infection incidence between children above and below 12 months can be traced to the influence of Balinese religion and child rearing practices. For example, before a Balinese infant reaches a certain age, he is specifically prohibited to come into contact with the ground. Eventually even after that point when a Balinese infant makes his first contact with the ground, he simultaneously becomes to be held and carried almost constantly. Indeed, compared with other preschool children, the night of less than 12 months in age crawling and sitting at ground level is an extremely rare event. Another problem is excreta disposal. Through excreta disposal is initially localized in irrigation ditches or gardens, such attempts are quickly defeated through the activities of numerous free ranging pigs and dogs which subsequently randomly distribute fertile parasite eggs throughout the range of human habitation including thatch-floor food preparation area. The opportunity of coming into contact with contaminated soil within the vicinity of Balinese houses are therefore considerable.

The intensity of helminthic infection represents a threat to people’s health. The 12-month-old children or younger who are infected, are only harbouring single infection, namely and exclusively *Ascaris* (TABLE 2). Nothing else are detected in this cohort. By way of contrast, in the 1–5 cohort infection with *Trichuris* was widely detected, although in most cases mild. It should be stressed that since most children in this cohort are harbouring mixed infection, the mild *Trichuris* infection is in addition to a moderate or heavy *Ascaris* infection in most cases. The potential for additive consequences in such a situation should not be overlooked. The parents among adult females is again similar to theprofile exhibited by 1–5 year children, that is a predominance of moderate or heavy *Ascaris* infection usually coupled with mild *Trichuris*.

Among both adult females and young children, hookworm infection is rare. This fact is probably attributable to the location of study area in close proximity to a recently active volcano and the resultant high clay content of soil in the region. This environmental factor is unavailable for the hookworm life cycle which requires sandy soils in order to flourish.

The complete absence of *Trichinella spiralis* infection was a surprise. The Balinese are avid consumers of pork, particularly on ceremonial occasions when rice (a mixture of chopped pork meat, inands and blood) is staple. The pork
hookworm, to cause the as single or as more intensive as bar stools was observed. In the H.E.L.P. shows, the stools were not charred.

The children were often neglected, often not coming to the school for many days. In some cases, the health of the child was markedly affected.

In a few cases, the children were not brought to the school. This was often due to the parents' lack of knowledge of the importance of regular school attendance.

Health education programs are necessary to improve the health of these children. These programs should focus on the importance of regular school attendance and the benefits of proper nutrition and hygiene.

CONCLUSION

The high prevalence of hookworm infection can be linked to a variety of environmental and socio-cultural factors. The high density of the infestation is due to the poor sanitation and hygiene practices in the area. The high prevalence of hookworm infection highlights the need for effective and sustained intervention strategies.
Silence and intensity of infection. The bordetella infestation was found to be rare, while klebsiella was not detected.

According to the factors described, the klebsiella frequencies between inner and outer benders were insignificantly different. This result can be attributed to the continuous influence between the two type of benders which is all prevailing.

The periodical deworming suggested to be given in the nation-wide supplementary food programme to under five children has already been launched.

REFERENCES


