PREVALENCE AND INTENSITY OF INFECTION OF SOIL-TRANSMITTED HELMINTHIASIS , KHORRAMSHAHR AREA IN SOUTHERN PART OF IRAN

by
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The importance of parasitic diseases which constitutes a continuous drain upon the health of the human being in the developing as well as under developed countries are well known. Realising the felt need of these countries, steps taken by world Health Organisation in sponsoring the course in "Malaria and other Parasitic diseases" and the University of Tehran for accepting such upheaval task in organising the same are worth praising.

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DEDICATION

To those millions of innocent and unprevileged mankind who are struggling day and night to survive in this sophisticated modern World within host, agent and evnironmental vicious circle interplay.

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CHAPTER ONE

Introduction

Intestinal helminthiasis or in other term metazoal parasitic infection of the intestine is one of the best example in medical epidemiology where host, agent and environment has got complex interrelationship in the causation of the infection and its maintenance in the community in endemic form. In nature every living being is subjected to continuous exposure to its environment. Human being cannot escape this law of nature and always experiences reciprocal influence from its environment. Thus helminthiasis falls in this category and has become one of the major public health problems which up to last few decade has failed to attract the attention of medical services due to the absence of overt clinical symptoms. Helminthic infection may not cause directly any alarming diseases in the human host but indirectly it robs the individual of his energy and ambition, interferes with his nutrition and ultimately makes him more susceptible to other various infectious diseases. It is a community disease with suboptimal clinical manifestation, hindering in the long run the socio economic upbringing of a country. This has been logically laid down "It is a safe assumption that parasitic worms are adversly affecting the health status of human population in essentially all part of the world, even in the most developed countries where worm infection are relatively mild or few in number, the ones occuring will be rightly regarded as harmfull". (W.H.O. 1964)[1]

Stoll in the year 1947, made a startling estimate that 2200 million persons in the world are having helminthic infection inspite of the appreciable advancement in the struggle for finding out the factors responsible in the disease process. The disease is such a complex one, that the most complacent developed countries too are afraid of the resurgence of the problem any time as a result of sinking world barring limitation in immigration and emmigration. (Woodruff, 1970)[2].

Out of an estimated population of 3035 million (excluding China and Democratic Republic Of Vietnam) (W.H.O. Wkly, Epidem, Rec. Nos. 45,47, 48; 1974)[3]. Ansari(1975)[4] , gave an account that 1459 million population in different parts of the world estimated to be infected with important incapacitating soil transmitted helminths like Ascaris lumbricoides, Trichuris trichiura, Hookworm, Strongyloides stercoralis, and Trichostrongylus . This estimate might not have projected the prevalence of the helminthic infection in true representative manner but gives a rough indication of the situation of some countries or parts of the countries where studies have been done. The gravity of the situation may be much more as two third of the population in the developing countries still live in the rural areas where geographic pathology is active in the dynamic interplay between man and its environment which is the most important ecological factor for the disease.

Some of the developing countries had approached the problem in a realistic manner and several studies have been carried out and had provided the baseline data on the basis of which some measure

can be taken while others are still in infancy. Iran is one of such country, where studies on prevalence of different helminthic infection in different parts have been carried out providing base line data but some parts were still needed this exploration.

Only qualitative (prevalence) survey can not provide the real picture of the problem of helminthiasis in a community, as such quantitative egg count is needed. Such information gathered from a community provides an index of the status of helminthic problem there-in and the health status as a whole. In helminthiasis survey, it is imperative to know as to which section of the population are the chief sources of dissemination of the infective stage. The prevalence fluctuates with the intensity of infection as heavily infected persons may remain free from sign and symptom while others less heavily infected may suffer severely although the heavily infected one are more dangerous for the community.

The main aim and objective of this study can be summerised as:

a) Gather knowledge about the method and technique of the survey.

b) Transmission potential, involving host, agent and environmental factors in the maintenance of the endemicity of the infection can be acknowledged.

c) Provide base line data for finding out feasibility of control measures.

d) Compare the outcome of this study with similar one in this country and in other parts of the world.

d) Apply such type of study technique in my own country as a public health measures, being the ecological factors similar in that community.

CHAPTER TWO

Literature Review

The evolution of knowledge and literature can be attributed to three phases of civilisation as ancient, mediaeval and modern.

In ancient period references can be found in Persian, Indian, Egyptian, Greek, Roman and Arabic medical literature but those knowledge was very limited up to 17th century, Haeppli (1956)[5]. Ancient literature dates as back as 6th century B.C. Though, it was limited, recognisable description about Taenia, Ascaris, Filariasis and of a syndrome due to an abdominal worm"heltu" can be found in the Ebers-Papyrus in 1600 B.C. Similar references made also by Hippocrates (460-357 B.C.). Aristotle also recognised worms in pigs, but most of the credit goes to the mediaeval age when Avicenna (980-1037 AD) recognised 4 types of intestinal worms according to the size and shape and also correlated the ecological factors, symptoms and treatment, Chandler et al (1962)[7], Watson(1960)[6].

The modern civilisation is the epoch of the scientific advancement in the knowledge of helminthology, when Francisco Redi, father of parasitology gave an insight that Ascaris had male and female worms and produce eggs, Chandler and Read., (7). During 18th and 19th century, the progress was further pushed while most important soil transmitted helminths like A. lumbricoides (Linnaus, 1758), T. trichiura (Linnaus, 1771), A. duodenale (Dubini, 1843), S. stercoralis (Bavay, 1843) Stiles and Hassali, 1902 were discovered and their toxonomy were made known to others in this field. Zeeder in 1800 recognised five classes of worms which later on Radolphi

named as Nematoidea, Acanthocephala, Nematoda, Cystoda and Cystica (which later on found to be the larval stage of Cystoda) Chandler and Read., (7).

Distribution, prevalence and endemicity of helminthiasis depend upon host parasite system, as such certain biological consideration need to be fulfilled for the transmission of the infection combined with micro and macro environment which influences the host parasite relation in acquiring the infection and its maintenance in the community. Several studies have been carried out throughout the world during the modern sophisticated scientific era and a good deal of knowledge have been gathered to evaluate all the factors playing its role in the causation of the infection. So the review of different literature needs to be summarised under different heading.

Prevalence & Distribution

According to W.H.O. (1) the disease is declining in some countries like Japan, Egypt, but in some countries the situation is more or less static while in others it is increasisng due to immigration. To summarise these observations on the prevalence of the various species of soil-transmitted helminths, it appears that Ascaris is still cosmopolitan. In W.H.O. African region Hookworm is the most prevalent helminths though Ascaris and Trichuris infection are still high. Strongyloides infection (24%) prevalent in parts of Kenya, the northern district of Mozambique and the island of Principe. In South Africa Ascaris and Trichuris are high but Hookworm rate is relatively low.

In American region the infection rate has fallen down in Greenland, Alaska, and Canadian Arctic but Texas showed 33% of Hookworm in recent studies. In Puerto Rico, Hookworm is declining but Trichuris infection is as high as 80%, Ascaris 31%, Hookworm 27%, and Strongyloides stercoralis 5%. In Tropical region of South America the helminthic infection is very high. Survey showed Hookworm as high as 98%.

In Mediterranian region rural areas of Bagdad showed hookworm in 55%. In Iran hookworm is high in Caspian littoral but Trichostrongylus in southern part of Iran. In other part of this region hookworm is the most prevalent infection followed by Trichuris and Trichostrongyloides. Ascaris in Alexandria recorded to be 71%. Lahore district of West Pakistan showed hookworm to be 36%.

In European region helminthiasis do not constitute public health problem except Trichuris which ranges from 40 to 88%. Only in Turkey hookworm infection though recorded to be low but Ascaris and Trichuris infection rates were 40% and 50% respectively.

In South East Asia region, Ceylon, showed Ascaris 49%, hookworm 45%, and Trichuris 42%. Ascaris is the only parasite mostly prevalent in India, though hookworm and Trichuris also have been recorded in high rates from some parts like Jaipur, Udaipur, Uttar Pradesh and Madras. Indonesia has recorded Ascaris 64%, hookworm 89%, and Trichuris 87%.

In western Pacific region particularly in Malaysia the helminthiasis infection rate in recent years stands as it was 30 years ago. In medical students 3% of hookworm and in farm areas 78%

of the same helminthiasis has been recorded . In Portuguese Timor, Ascaris 94%, hookworm 70%, and Trichuris up to 50% has been recorded. In Australia, dissemination of hookworm in aborigines still present and the rates being 20.5%for Ascaris and 63.9% for Trichuris. In Cook island Ascaris and Trichuris are present in 69%, and 41% of the population. In Korea Ascaris 67%, Trichuris 10% and hookworm 6% has been recorded. High rate of 75% of hookworm has been recorded in Chungking part of China. Hookworm in rural villages of Taiwan along with Ascaris and Trichuris are highly endemic showing hookworm as high as 85%. In the Philippines, recent studies show hookworm, Ascaris and Trichuris infection rates are high.

The above said distributions of different helminthiasis show to some extent the gravity of the global situation in nut-shell.

The recent studies in some of the countries by different authors will furtheremore help in reviewing the latest situation about the prevalence of the helminthic infection.

In Dacca (Bangladesh) recent studies amongst 933 students Muttalib et al(1975)[8] , showed 57.3% had single infection and Trichuris was the commonest one.

High prevalence of Ascaris (81.3%) followed by Enterobious vermicularis (57.6%), Trichuris trichiura(46.2%), hookworm(33.7%), Taenia (5.7%), Strongyloides stercoralis (4.4%)and Hymenolepis nana (2.6%) has been recorded in Orchid island, Taiwan Bergner et al (1973) 9.

Knin-Ohn-Lwin 10, et al (1972)[10] recorded an overall prevalence of 63%,with Ascaris 46.7% as a major one followed by Trichuris and