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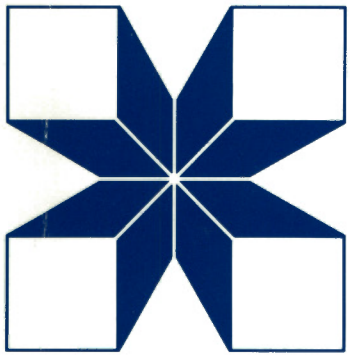

CANADA

ZOONOTIC AND PARASITIC DISEASES

PROCEEDINGS OF THE THIRD INTERNATIONAL AND PAN-ARAB SEMINAR HELD IN AMMAN, JORDAN, 17–20 OCTOBER, 1989

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La présente série est réservée aux documents issus de colloques, aux rapports internes et aux documents techniques susceptibles d'être publiés plus tard dans une série de publications plus soignées. D'un tirage restreint, le rapport manuscrit est destiné à un public très spécialisé.

Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.

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ZOONOTIC AND PARASITIC DISEASES

Proceedings of the Third International and Pan-Arab Seminar held in Amman, Jordan, 17-20 October 1989

Edited by
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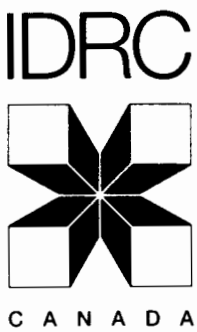

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ABSTRACT

on

ZOONOTIC AND PARASITIC DISEASES IN THE MEDITERRANEAN AREA

By Dr. George Papadopoulos

Director, Mediterranean Zoonoses Control Centre

There is a wide range of zoonotic diseases of bacterial, mycotic, parasitic and viral origin which are common to many Mediterranean countries and involve a complex interaction between human and animal populations. Zoonotic infections may cause: deterioration of human health, extended suffering, decrease of productivity, shortening of life span, invalidism and premature death in man. They may also affect animals' health, their productivity, national economies and the world's food supply.

In this working paper are cited the most important zoonotic diseases which have the greatest impact on public health and on the economy of the countries of the Mediterranean area. They are divided according to the etiological agents' position in biological classification. Among the zoonotic diseases of bacterial origin, Brucellosis and Salmonellosis seem to be most prevalent in the countries of the area, followed by Anthrax, Listeriosis and Tularaemia, while Lyme disease, Leptospirosis and Campylobacteriosis are less reported or not well studied. From the zoonotic diseases of parasitic origin, Echinococcosis is the most widespread in the Mediterranean countries, followed by Leishmaniasis, Amoebiasis, Taeniasis, Toxoplasmosis and Trichinosis, while Myiases which have been introduced very recently from the American continent into North Africa may have serious consequences to livestock and probably to man for the countries of the region.

From the zoonotic diseases of viral origin, Rabies remains endemic in some Mediterranean countries, while Rift Valley Fever, though it appeared only in Egypt in 1977, must be continuously under surveillance because of its serious consequences in humans and livestock.

Among the Rickettsial diseases, Boutonneuse Fever and Q-Fiver occur in some Mediterranean and Middle East countries.

The Mediterranean Zoonoses Control Centre, with the collaboration and support of WHO (both Headquarters and Regional Offices), EMRO and EURO and other international organizations, agencies and WHO Collaborating Centres, will make every effort to control and reduce the incidence of the above mentioned zoonoses.

Introduction

Zoonotic diseases have had a tremendous impact on the evolution of man, especially on those cultures and societies that have domesticated and bred animals for food production.

For many years and in many countries, zoonoses and food-borne diseases, with their reservoir in domestic and wild animals, have imposed and are still imposing a very heavy burden, especially among the vast number of people living and working in rural areas. However, the great changes of the last decades, especially the increasing urbanization (not always well-planned or having taken into account the balance of ecological situations), the large movements of populations, the vastly increasing means and speed of transport, and even tourism have contributed to making the problem of zoonoses not only rural and characteristic of well defined areas, but really world-wide.

In many developing and other countries, the conditions with respect to prevalence and socio-economic consequences of zoonoses and food-borne diseases have actually deteriorated in recent years because:

a) changing land-use patterns, farm management and animal industries have led to ecological developments without appropriate controls of their respective health hazards;

b) rapidly developing food industries and changing consumer habits have not been accompanied by adequate services of disease surveillance and control;

c) as developing countries have expanded their animal industries (so much needed for improving the food supply situation and for increasing income through exports), man zoonoses such as brucellosis and hydatidosis have assumed increasing economic significance; and

d) zoonoses associated mostly with domestic and commensal animals in urbanised areas, such as Rabies, Hydatidosis and "newly emerging" zoonoses (e.g., Rift Valley Fever, food-borne diseases, etc.) have become an increased hazard to the growth of the animal population and to the health and well-being of the human population as a consequence of urbanization, travel, tourism and trade.

During this spread, environmental factors (from physical to social ones) have played an important role; and the environment itself has suffered, through the alteration of ecological conditions, as a result of the zoonoses increase. Such an increase certainly contributes to the pollution not only because of the agents and dangerous vectors, but also through many of the control

measures such as the wide-spread application of pesticides, with far-reaching consequences in so many biological cycles which negatively affects human health and well-being.

The booklet, "Zoonoses Control", prepared by UNEP/USSR cites:

> "The number of known Zoonotic Diseases is on a constant increase. Many zoonotic and parasitic diseases which for a long time were considered anthroponoses have proved to be "masked" zoonoses. Investigations and research have managed to prove the existence of animals which are natural reservoirs of respective causative agents of diseases and the only reason that these remain unknown is that the pathogens of this group are spread among humans in the absence of their primary animal hosts or that the animal-reservoir cannot be immediately identified e.g. Yellow Fever, Leishmaniasis and others".

Many zoonoses were discovered at a comparatively late period and some of them quite recently. There is reason to believe that growing contacts between man and wild animals in nature, zoos, laboratories or preserves will cause further lengthening of the list of zoonotic infections.

The significance of zoonotic and parasitic diseases in the infection pathology of man can be considered on the basis of individual zoonoses of individual countries. Some zoonoses are "notorious" due to high occurrence of their lethal outcomes (rabies, plague, clostridial infections) and less to their morbidity. Other zoonoses like Salmonellosis, Leptospirosis, Anthrax, and Tapeworm cause mass morbidity and are regarded as most important among human infections. Many zoonoses affect man rarely but doom him to long suffering, ending with invalidism or premature death. Such is Echinococcosis, which is recorded in almost all countries of the Mediterranean area. The rate of infestation varies considerably. Limitation of space requires that the diseases present in different countries of the Mediterranean area can be referred to only briefly.

Zoonotic infections cause various kinds of losses to mankind, the most important of which are the two described below. The first is deterioration of human health, shortening of the life span and decreasing ability to work of zoonoses-affected people. The second kind of loss is associated with diseases of animals which adversely affect their productivity and their important contribution to the world's scarce food supply. Most important in this respect are zoonoses of agricultural animals. The fact that large agricultural animals have provided until now up to 85% of draft power in the

world is not yet fully recognized. Zoonoses cause heavy losses of high-quality protein food (meat, fish, etc.) which seems to be increasingly scarce among those populations who mostly need them, particularly children.

The wide range of zoonotic and food-borne diseases of parasitic, bacterial, viral and mycotic origin, common to so many developing countries, makes it almost impossible to develop adequate expertise and specialized services within each individual country. This has been one of the main reasons why major zoonoses such as Rabies, Hydatidosis, Salmonellosis and Brucellosis have as yet not been successfully controlled by national programs.

Modes of Transmission of Zoonotic and Parasitic Diseases

The usual modes of transmission of infection to man are by:

a) Contact, whether direct or indirect (like Foot and Mouth Disease, Anthrax, Brucellosis, Staphylococcosis), Dermatophytosis, arthropod infection (Scabies).

b) Inhalation (Tuberculosis, Q-Fever, Lassa Fever, etc.).

c) Ingestion (Salmonellosis, Shigellosis, Sarcosporidiosis).

d) Vectors such as arthropods or other invertebrates which transmit the infection either mechanically or biologically (Murine Typhus, human Plague, etc.).

e) Inoculation (Leptospirosis, Brucellosis, Q-Fever, etc.).

Zoonotic Diseases in the Countries of the Mediterranean Area

In the following pages we will briefly describe the most important zoonotic and parasitic diseases which have the greatest impact on public health and on the economy of the countries of the area. Prevention and control measures will also be briefly discussed.

I) Bacterial Diseases

a) Anthrax

Active foci in which domestic animals are chiefly involved occur in several Mediterranean countries, particularly in those of North Africa and West Mediterranean.

Prevention and control: Disinfection of animal products, wool and hair; vaccination of animals and high-risk persons; proper disposal of infected carcasses.

b) Brucellosis

The disease is present in all Mediterranean countries and the greatest prevalence in man occurs in those countries which have a high prevalence of Brucella melitensis infection among goats, sheep or both. Camels are also infected, especially when herded with infected animals of other species.

Prevention and control: Test and slaughter (where possible); pasteurization of milk and dairy products; boiling the milk when pasteurization is impossible; vaccination of cattle, sheep and goats. Ultimate control of human Brucellosis rests on elimination of the disease among domestic animals. Immunization of high-risk occupational groups is not performed in the MZCP countries with the exception of France where some trials have been carried out in highly exposed professional groups.

c) Campylobacteriosis

Campylobacter jejuni is considered one of the principle agents causing diarrhea and enteritis in man especially in developed countries. Wild and domestic mammals and birds constitute the large reservoir of this agent. Very few cases are reported from the developed Mediterranean countries.

Prevention and control measures: Pasteurization of milk; hygiene in milk handling; avoiding consumption of untreated water and undercooked chicken.

d) Leptospirosis

The disease has a high prevalence in tropical countries with heavy rainfall and neutral of alkaline soils. In general, outbreaks in man are caused by exposure to water contaminated with urine of infected animals. Occupational groups are particularly at risk. Wild and domesticated animals are essential for the maintenance of pathogenic leptospiras in nature.

Prevention and control: Personal hygiene; rodent control; avoiding swimming in contaminated water.

e) Listeriosis

Listeriosis monocytogenes has long been known to be pathogenic in man and animals. According to the data collected recently, the disease is present in a limited number of Mediterranean countries. Human infection is mostly due to the consumption of contaminated milk, dairy products (notably soft cheeses), contaminated vegetables, etc.

Prevention and control: Pasteurization of milk; rodent control; proper handling of silage.

f) Lyme Disease

The disease is caused by Borrelia burgdorferi and is transmitted by ixodes ricinus. In the European part of the Mediterranean area the infection has been found where looked for. Transmission seems to occur from an infected wild animal to another animal and probably to man through a tick bite.

Prevention and control: Tick-infested areas should be avoided. Tick control in wild animals host where possible should be implemented, but this is almost impossible.

g) Salmonellosis

It is obviously the most prevalent food-borne zoonotic disease in the countries of the Mediterranean area. It is also well known that there is no other zoonosis as complex in its epidemiology and control as salmonellosis. It is associated with intensification of animal husbandry, farming practices, movement of animals, urbanization, tourism, customs and habits, environmental conditions, food harvesting and processing technologies, etc. Unfortunately, in many countries of the Mediterranean region salmonellosis cases that occur may never be attended to by medical personnel and therefore very little is knows, with regard to the epidemiology and surveillance systems. Food of animal origin is the main source of infection but water can serve as a vehicle of Salmonella infection for both man and animals.

Prevention and control: Decontamination of feeding stuffs, food and wastes; hygienic slaughter processes and dressing procedures; rodent control; stray dog control; appropriate legislation for the import export of animal feed and products of animal origin; hygienic measures in

restaurants, kitchens, hospitals; examination of food handlers, education of food handlers and consumers by mass media and other means.

h) Tularaemia

Foci of tularaemia, caused by Franciella tularensis, exist in some of the European countries of the Mediterranean area and also in Tunisia and Turkey.

Prevention and control: Rodent and arthropod control; occupational and personal hygiene in high risk areas; avoiding consumption of raw or undercooked meat; live attenuated vaccination of population at risk; education of the public to avoid bites of flies, mosquitos, ticks, etc.

II) Parasitic Diseases

a) Leishmaniasis

a) Visceral leishmaniasis (Leishmania donovani infantum) has a low endemicity in the Mediterranean area although many countries have active foci since a great percentage of dogs are infected. Children up to 10 years of age are mainly infected. The growing number of dogs (kept as companion animals) and the halting of insecticidal antimalarial campaigns have led to an increase of the disease.

b) Cutaneous Leishmaniasis exist along the Mediterranean area but mostly in the southern part of Maghreb countries and in the Middle East. It occurs in three forms: the zoonotic, caused by Leishmania major; the anthroponotic, caused by Leishmania tropica; and the skin lesions, caused by Leishmania donovani.

Prevention control: Control of dogs, including strays and wild canine species, and rodents; insecticide control; personal protective measures.

b) Toxoplasmosis

Although one of the most widespread zoonoses occurs very rarely in the countries of the Mediterranean region, it has recently come into prominence as a serious resuscitated complication of AIDS. Human cases reported in recent years have been associated with consumption of raw or undercooked meat, ingestion of raw goats milk or

through oocysts in cat faeces. From the public health and economic standpoint, the important animal species affected are sheep.

Prevention and control: Cooking of meats; avoiding contact with cats and cat faeces. Some countries (e.g. France) have introduced preventative measures such as serologically screening women before or during pregnancy.

c) Amoebiasis

Both forms of infection by Entamoeba histolytic and Entamoeba polecki have been reported to be present in the Mediterranean region. The first is essentially a human parasite that can be transmitted to lower animals and the second parasitizes mainly swine and can be transmitted to man.

Prevention and control: Environmental sanitation; sanitary disposal of human faeces; fly control; education of the public.

d) Echinococcosis/Hydatidosis

This disease continues to have high morbidity rates, to cause much suffering in populations of the Mediterranean area, and to give rise to high economic losses both in the public health sector and the animal production industry. Highest infection rates in man are recorded especially in sheep-raising countries, but camel-raising countries are also highly infected. What greatly contributes to the creation and perpetuation of the disease, especially in the mediterranean region, are the favourable conditions created by man, the existing physical and chemical properties of the parasite, the large number of small, ill-equipped and unsupervised slaughterhouses, illegal slaughtering, the high population of stray dogs, etc. On the basis of estimates, ore than 8,000 human cases appear annually in eight out of twenty countries belonging to the MZCP (Mediterranean Zoonoses Control Programme).

Prevention and control: Prevention of dogs, access to infected animals, offals; dog population control; surveillance of slaughter animals and dogs; personal and environmental sanitation; treatment of dogs; education of the public.

e) Taeniasis and Cysticercosis

Although both species T. saginata and T. solium are distributed throughout the world only in a very few countries of the Mediterranean region are they considered to be endemic, especially T. saginata (Syria, Lebanon, Yugoslavia).

Prevention and control: Thorough cooking of beef and pork meat; avoiding use of sewage effluents for pasture irrigation; meat inspection; education of the public to prevent soil and water contamination with human faeces in rural areas.

f) Trichinosis

With hygiene improvements and regular pork meat inspection the incidence of Trichinella spiralis has been reduced remarkably in the Mediterranean area. However, some outbreaks of human Trichinosis were detected a few years ago in Algeria, and more recently in Egypt among Copts and tourists.

The main reservoirs of T. spiralis is nature are wild carnivores. In sub-Saharan Africa, only a wild cycle is known.

Prevention and control: Adequate heat or cold processing of pork and pork products; cooking of garbage and offal before feeding to swine; education of the public to cook all fresh pork and carnivorous game; rodent control.

g) Myiasis

The most dangerous form of myiasis is caused by the screw-worm flies Cohliomya hominivorax and Chrysomya bezziana. The recent introduction of C. hominivorax from the American continent into North Africa could have serious consequences to livestock, wildlife and possibly human populations in Africa, the Middle East and Southern Europe.

Prevention and control: Treatment of navel stumps of neonatal animals and babies; treatment of infected people and animals; treatment of accidental wounds.

III) Viral Diseases

a) Rabies

Rabies remains endemic in the countries on the northern shore of the Mediterranean Sea from Eastern Italy, and throughout Eastern Europe. A significant role in the spread of rabies in some Mediterranean countries is played by wild animal species (foxes, jackals and wolves) while in other countries dogs and cats are mainly responsible for rabies transmission. Bat rabies has become an increasing problem in maritime areas of countries which were considered free of rabies (e.g. Spain).

Prevention and control: Control of domestic carnivores (registration, vaccination, reduction of dog population density and movement, control of stray dogs; international quarantine regulations; reduction of the density of the main hosts (foxes, etc.); oral vaccination of foxes as promising wildlife. Human pre- and post-exposure treatment with vaccines.

b) Rift Valley Fever (R.V.F.)

The disease is distributed throughout a large part of the African continent. In 1977 an alarming outbreak occurred in Egypt causing the death of about 600 people, while in 1978 there were at least 400 cases. The disease has a heavy impact on livestock productions because of abortions and mortality of productive animals (sheep, cattle, buffaloes).

Virus transmission:

- by arthropod vectors (various species of mosquitoes);
- by direct infection (close contact with live and dead animals); and
- by animal products, (milk and milk products).

Prevention and control: The most effective mechanism for the control of R.V.F. is the immunization of susceptible animals with a potent vaccine. An inactivated vaccine is also available for immunizing man. Environmental measures (improved drainage and effluent water management). Insecticide campaign; control of imported animals.

IV. Rickettsial Disease

a) Boutonneuse Fever

Its etiological agent is Rickettsia conori and the principal nonhuman vertebrate hosts are wild rodents and dogs. It occurs in some Mediterranean and Middle East countries. Most of the cases in the Mediterranean region occur in summer when ticks are most active.

Prevention and control: Tick control on dogs. Tick-infested areas should be avoided. Personal protection.

b) Q-Fever

Its etiological agent is Coxiella burneti. Cattle, sheep, goats, wild animals and ticks are natural reservoirs. It occurs in few Mediterranean countries. Occupational groups are mostly affected.

Prevention and control: An inactivated vaccine for the occupational groups has been developed; pasteurization or boiling milk; destruction of placentas and fetal membranes.

The Mediterranean Zoonoses Control Programme (MZCP) and its coordination centre, the Mediterranean Zoonoses Control Centre, in close collaboration with the Head Quarters of the World Health Organization (WHO) and the WHO Regional Offices, EMRO and EURO, and other international organizations, with the MZCP participating countries, WHO Collaborating Centres and other Participating Institutes is making every possible effort to reduce the incidence of the above-mentioned zoonoses in the Mediterranean area and to fulfill the common goal of "Health for all in the Year 2000".