

The epidemiology of hydatid disease in England and Wales

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SUMMARY

The epidemiology of hydatid disease in man in England and Wales, based on the data collected between 1981 and 1983 at the Hydatid Reference Laboratory of the Public Health Laboratory Service, is presented. The incidence of hydatid disease was 4·2 cases per annum, with 2 cases per million population occurring in Wales and 0·2 per million in England. The highest prevalence was in London amongst the immigrant population. The incidence in the indigenous population was 15·5 cases per annum, with 5·6 cases per million occurring in South Powys, parts of South Wales and Herefordshire. The population most at risk is the rural, farming community in that area, but the West Midlands is also an apparent focus of the disease.

INTRODUCTION

Wales has long been recognized as the focus of infection for hydatid disease in the UK. The epidemiology of hydatidosis in Wales has been reviewed by Walters (1978) and the possibility of eradication discussed (Clarkson, 1978). It was recommended that the epidemiology of the disease in man should be studied so that resources might be most effectively used. Unfortunately, it is difficult to obtain accurate figures on the incidence of hydatidosis since the disease is not notifiable. The number of deaths due to hydatidosis recorded by the Registrar-General for the last decade indicate that it is only a minor problem, with an average of five deaths per year. However, since the clinical disease is usually successfully treated by surgery and many infected people remain asymptomatic, the number of deaths is a poor indication of incidence.

The Public Health Laboratory Service has provided a serodiagnostic service for hydatid disease for many years, but in 1981 a national Hydatid Reference Laboratory (H.R.L.) was established in Liverpool to provide a service for the serological diagnosis of hydatid disease in England and Wales. The results of this serology were used to investigate the epidemiology of the disease.

MATERIALS AND METHODS

Serum samples submitted to the H.R.L. were screened by the complement fixation test (C.F.T.). A titre of 8 or more was considered to be positive (Bradstreet, 1969). The reports from the laboratory of the positive tests were accompanied by two forms, to be returned by the clinician, to obtain further information.

The first form, to be completed immediately, was to obtain information on age, sex, address, country of origin and number of years in the UK, association with sheepdogs, any previous history of hydatid disease and presenting signs, symptoms and investigations. The second concerned the diagnosis, details of treatment and outcome, to be returned later, when the information became available.

A more detailed survey was conducted on surgically proven cases of hydatid disease who had apparently acquired the infection in the UK. Patients were contacted directly, with the permission of their doctor, and asked to complete a questionnaire to obtain information regarding geographical localization and the history of their condition.

RESULTS

Patients involved in the survey

Three thousand serum samples from 2642 patients were submitted to the H. R. L. from February 1981 to February 1983 inclusive, and 415 were serologically positive. Replies were received from the initial questionnaires for 269 patients, in 160 of whom the diagnosis of hydatid disease was confirmed surgically. Eighty-four of these were 'new' cases during the two-year period and 76 had hydatid disease diagnosed prior to 1981 ('old' cases). Thirty-one of the 84 new cases were normally resident in England and Wales.

Fifty-seven patients were included in the more detailed survey. Fifty patients replied, 46 of whom had apparently contracted the disease in England or Wales. A more limited amount of information was available from a further 11 patients, who were, therefore, included in the survey. Thus, the more detailed study was of 57 cases, 31 of whom were 'new' cases and 26 'old' cases.

Sex, age, site of cysts

The sex and age at diagnosis of the patient and site of cyst in 134 confirmed cases are given in Table 1 and the geographical distribution of 125 of these in Fig. 1. Hepatic cysts were more common than cysts in other sites and significantly more females had hepatic cysts than males (57% and 36%, respectively, $P < 0.05$). There was no statistically significant difference in age distribution, which ranged from 2 to 85 years.

Similar information on the 57 indigenous cases is given in Table 2 and Fig. 2. Ages ranged from 10 to 81 years. There was no significant difference in age at diagnosis between the 'new' and 'old' patients, nor was diagnosis made significantly more frequently in any of the groups. The number of females with hepatic cysts was again significantly greater than other groups ($P < 0.05$).

Table 1. Sex and age of patients and site of cyst in confirmed cases of hydatid disease 1981-1983

Age (years)	Male		Female	
	Site	Total no.	Site	Total no.
< 20	3H } 3P } 10 }	7	1H } 1P } 10 }	3
20-40	7H } 1P } 50 } 1H & P } 1H & O } 4U }	19	13H } 10 } 2H & P } 1H & O } 2U }	19
40-60	7H } 4P } 20 } 1H & O } 3U }	17	12H } 1P } 1H & O } 6U }	20
> 60	4H } 1P } 10 } 5U }	11	5H } 2P } 10 } 5U }	13
Age unspecified	3H } 2P } 30 } 4U }	12	8H } 1P } 1H & P } 3U }	13
Totals	24H } 11P } 120 } 1H & P } 2H & O } 16U }	66	39H } 5P } 30 } 3H & P } 2H & O } 16U }	68

Overall: hepatic cysts (H), 63 (61.8% of the 102 cases where site of cyst known); pulmonary (P), 16 (15.7%); other organs (O), 15 (14.7%); hepatic and pulmonary (H & P), 4 (3.9%); hepatic and other organ (H & O) 4 (3.9%). Unspecified site (U), 32.

Geographical distribution

Thirteen (42%) of the 31 'new' cases were living in Wales (11 cases) or Herefordshire (2 cases) and at least 7 of the remainder probably acquired the disease in Wales. Detailed information was only available from 4 of the other 11 cases. One was from a family of butchers; one a schoolboy from Birmingham who lived in a children's home and had rarely been out of Birmingham; one a farmer near Stoke-on-Trent who died in 1982, aged 83, and one was a film producer who fed raw offal to his dog and had also travelled widely over the previous 20 years.

Thirteen (50%) of the 26 'old' cases were living in Wales (11 cases) or Herefordshire (2 cases) and case histories of a further 7 suggest that they acquired the disease in Wales. Of the remaining six, one died, aged 80, in Manchester and one was a 78-year-old woman from Liverpool. One man had apparently acquired



Fig. 1. Place of normal residence in England or Wales of 125 cases of hydatid disease whose sera were submitted for serology in 1981-3. ●, 1 case; ●, 10 cases.

Table 2. *Distribution of sex and age of patients and site of cyst in confirmed indigenous cases of hydatid disease*

Age	%	Male	Total	Female	Total
< 20	21	2H, 2P, 10, 2U	7	2H, 2P, 10	5
20-40	30	2H, 3P, 10, 1H&O, 1U	8	7H, 1H&O, 1U	9
40-60	23	2H, 2P, 10	5	5H, 1P, 2U	8
> 60	26	4H, 2P, 10, 3U	10	3H, 1P, 1U	5
			30		27

the disease whilst visiting farms in Derbyshire. One woman remembered handling sheepdogs on a farm holiday in Cheshire in 1939 and also visited Stoke-on-Trent meat market regularly as a child and touched dogs there. One patient could give no clue as to where he acquired the disease. One 14-year-old boy probably became infected when he was about 7 years old when he regularly helped to feed lambs on a farm on the outskirts of Wolverhampton, where, no doubt, there were also sheepdogs.

Thus, 26 (45.5%) of the cases resided in Wales or Herefordshire and at least a further 14 (25%) probably acquired the disease in Wales. Only 5 people were likely to have become infected outside Wales within the last 20 years. However, 2 of these failed to reply to the questionnaire, one living in Bristol and one in London.



Fig. 2. Place of normal residence of 57 known cases of hydatid disease whose sera were submitted for serology in 1981–3 and who had apparently contracted the disease in England or Wales. ●, 'New' case [31]; ○, 'old' case [26].

Contact with dogs

Thirty-nine of the 44 people surveyed had close contact with dogs, 30 with sheepdogs. Eighteen of the 44 fed raw meat or allowed their dogs to scavenge carcasses. Seventeen (38%) worked, lived or were brought up on farms and 3 worked in the meat or catering trade. The remaining 23 were variously employed. Five of these lived in Wales, 5 had lived there and 6 had visited Wales.

Recurrence of cysts

Recurrent or persistent cysts requiring repeated operations or, in recent years, medical treatment were reported by 16 (32%) of 50 people. One patient reported persistent symptoms 5 years after surgery.

Incidence

The incidence of hydatid disease for England and Wales was 42 per annum, which, in relation to population, was 2 cases per million for Wales and 0.2 per million for England.

London had the highest prevalence of disease in the country, but the majority of cases occurred in immigrants or people who had not originated in London. Immigrants from Cyprus and the Middle East accounted for 11.5% and nearly 10%

Table 3. *The number of cases of hydatid disease and the annual incidence (per 100 000 population) in the counties of Wales and Herefordshire.*

County	1953–62* incidence	1981–83 no. of cases (incidence)
Gwynedd	0.85	0
Clwyd	0.66	0
Dyfed	0.73	1 (0.15)
Powys	3.93	6 (2.73)
West, mid and south Glamorgan	0.64	3 (0.32)
Gwent	0.62	1 (0.12)
Herefordshire	—	2 (0.76)

* Howell (1940).

of these cases, respectively. The West Midlands (UK) was also a focus of the disease.

The incidence of hydatid disease in the indigenous population in England and Wales was 15.5 cases per annum. The incidences according to county populations in South Wales and Herefordshire, compared to the incidence between 1953 and 1962 (Howell, 1940), are given in Table 3. Thirteen cases were from this area – an annual incidence of 5.65 per million.

DISCUSSION

These results indicate that hydatid disease persists in the UK and that the indigenous problem is confined almost exclusively to South Wales and the English/Welsh border area of Herefordshire. However, there may be a focus of infection in the West Midlands.

Previous investigations into hydatid disease in Wales recorded incidences of 14.4 cases per year from 1927 to 1936 and 21.6 from 1953 to 1962 (Howell, 1940; West, 1960).

The incidence of hydatid disease in the indigenous population is 15.5 cases per annum, according to the present study, representing a 30% decrease since the 1950s. Other hospital surveys in Wales probably included some of the same patients (Jonathan, 1960; West, 1960). Until about 1960 the majority of cases occurred in the industrial districts and comparatively few from agricultural areas. In about half the cases a history of a direct association with dogs was given. The urban cases were attributed to a heavy contamination of the environment with *Echinococcus* eggs from the large dog population. Dogs were thought to become infected by either being fed infected offal or by scavenging. By the 1960s the majority of cases came from rural areas and a definite connection with farming and sheepdogs was apparent (Thomas, 1966). Radnorshire and Breconshire (now South Powys) had the highest annual incidence, of 4.7–6.3 cases per 100 000 population. The industrial valleys of the south continued to have a relatively high incidence, however, which was attributed to the close association between man and dogs in the mining communities. In recent years no cases have been reported from North Wales. The mean number of deaths per annum for England and Wales was 15 for 1940–60 and 8 from 1960 to 1972. Between 1972 and 1981 there were 51 deaths, or 5 per annum – an incidence of 0.1 per million population.

Today, in England and Wales, the population most at risk is the farming community in South Powys and Herefordshire. Of the 57 patients in the survey, 25 were diagnosed after 1972 and 34 (72.3%) of these were aged under 60. Twelve (5.3%) were known to come from the South Powys or Hereford farming community and 2 were from other Welsh farming communities. Seven (20.6%) cited visits to Wales as the likely source of infection. Of the remaining 13, 8 were born in Wales originally or reside there, though farming connections were not stated. Five were from elsewhere (Bristol, London, Wolverhampton, Birmingham and Derbyshire, although neither the Bristol nor London cases replied to the detailed questionnaire). It can be deduced that about 85% of the cases diagnosed since 1972 probably acquired their disease in Wales. It follows that a profound effect could be exerted by concentrating a control scheme in the farming districts of South Powys (a pilot scheme has now commenced in a small part of this area) and extending it into Herefordshire, Glamorgan and east Dyfed.

The risk of hydatid disease becoming established in the West Midlands is high because large numbers of ewes from Wales are transported there for slaughter, particularly for consumption by the immigrant population. Dogs may become infected by scavenging carcasses of sheep which die on the large holding farms where sheep are kept prior to slaughter, or offal with small cysts may be missed at meat inspection and be fed to dogs.

There are a number of shortcomings in the data on which this study is based, particularly the difficulty of incomplete data, because of the voluntary nature of the methods used for the surveys. As with all postal surveys, a considerable proportion do not reply, which could alter the figures significantly. However, the information given here is the minimum number of cases, since all were confirmed cases of hydatid disease.

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