Eur. J. Epidemiol. 0392-2990
June 1985, p. 121-126

Vol. 1, No. 2

EUROPEAN JOURNAL OF EPIDEMIOLOGY

FASCIOLIASIS IN SPAIN: A REVIEW OF THE LITERATURE AND PERSONAL OBSERVATIONS

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Key words: Fascioliasis - Geographical distribution - Epidemiology - Diagnosis.

The fascioliasis induced by *Fasciola hepatica* is a syndrome which has still not been fully clarified in this country, though the different peninsular regions are suitable for completion of the life cycle of the worm; infested animals may found throughout these regions and in almost all of them human fascioliasis has been diagnosed, with the greatest incidence in the Basque Country, Navarra and La-Rioja. This greater appearance is probably related to the dietary habits in those areas, since the consumption of water cress is undoubtedly the principal source of contamination and is entirely responsible for the rest of the epidemiology of the diseases in humans.

In the cases studied, the clinical symptoms did not differ from those habitually found in this syndrome.

Serological methods have resolved the diagnosis in the acute phase of the disease and furthermore are of great use for monitoring post-treatment evolution.

The cases studied by this Department were diagnosed with immunodiffusion, haemagglutination and immunoelectrophoresis techniques and the evolution of the patients was also followed by immunodiffusion and haemagglutination.

INTRODUCTION

Although certain professionals continue to consider that human fascioliasis by *Fasciola hepatica* is an exotic example of parasitism in this country, the notion is highly debatable. Its incidence may be seen in an important number of cases and, furthermore, as it is not a disease subject to obligatory declaration, the true number of cases is undoubtedly greater than that reported in the existing literature.

Indeed, up to the 1970's cases appeared only sporadically (13, 19, 20, 21, 23, 33, 35) and on occasions their detection was the result of surgery aimed at discovering gallstones (7, 15). However, since 1978, considerable attention has been paid to the topic, possibly in view of the important studies carried out in France and other countries (10, 11, 18). In this sense, the first series to be described was that reported by Aguirre Errasti (2), after which the number of publications increased up to the present when more than 100 confirmed-cases have appeared, though only about 70 have been reported in the literature.

Our intention in the present article is to present a review of the existing data and to add the data obtained from the cases diagnosed in the department (16) with a view of attaining an overall picture of the situation in this country.

GEOGRAPHICAL DISTRIBUTION

In Spain, the first diagnosis of fascioliasis in a human being was carried out in 1890 by Martin de la Calle; the disease was detected in an agricultural labourer from Sauquillo de Cabezas (pro-

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Figure 1. - Geographical distribution of fascioliasis in Spain.

vince of Segovia) who died 18 months after onset of symptoms. Cases may in fact be found in any area of the country (Figure 1) though more cases have been reported in the north of Spain; in particular, important-foci have appeared in Vizcaya (1, 2, 30, 32), and Alava (5, 6) and certain authors are now of the opinion that the disease is « relatively common » in the Basque Country, and in other areas (Navarra, La Rioja, etc.) (4, 8, 9, 41) its occurrence is not rare.

Regarding our region, in the Department of Microbiology and Parasitology of the University Clinical Hospital seven cases have been detected since 1978 in which serological assays were employed (16). Previously, the department of Surgery had already described a case in which worms had been removed from the common bile duct (38).

ENVIRONMENTAL FACTORS

The establishment of fascioliasis in any area requires environmental conditions which permit the presence and reproduction of the intermediate host (snails of the genus *Lymnaea*, preferably *Lymnaea truncatula*) and the development of subsequent parasite phases which takes place outside the definitive host.

The two essential factors for completion of the cycle of *Fasciola hepatica* may be said to be: moderate temperatures and suitable humidity (17, 28). Other secondary factors are also necessary.

In this country temperature is adequate all year round in coastal regions whereas in the centre temperatures are too low in the winter months (24, 25, 26, 27). When temperatures rise or fall excessively, humidity is considerably reduced and accordingly the central zone is not suitable for completion of the parasites life cycle in winter (24, 25, 26, 27); however this factor may be extensively modified by artificial-irrigation (45). *Lymnea truncatula* has been found in regions as separated as Barcelona, Salamanca and Granada and though the study is not novel (20), its presence is confirmed today at least in Salamanca (45).

Animal parasitization occurs throughout the country with a moderate-high incidence (46).

In man, the occurrence of the disease is totally related to dietary habits and the digestive route is the only one that is accepted.

The ingestion of water cress is included in the anamnesis of the majority of patients, though to a lesser extent other aquatic plants and even horticultural species may vehicle the disease.

The important relationship of the disease with water cress means that though contamination may take place at any moment of the year, it is autumn, when the cress is eaten, when the greatest number of infestations occurs and thus is the season, along with winter, when the greatest number of cases are diagnosed.

The 75 cases reported in this country appear in Table 1. In the first instances, the case history of the patients was not described because the authors only reported the presence of eggs in faeces, when the patients were undoubtedly in the chronic phase (19, 20). The first reference in which details are given is that of Garcia Barón (15); of those that have appeared subsequently we have taken the following information.

EPIDEMIOLOGICAL ASPECTS

1) Water cress consumption was discovered on 52 occasions 69.3% (six of our patients had consumed cress); the rest were either referred to as consumers of vegetables or their dietary habits were omitted.

2) The disease is referred to as « markedly seasonal » and (among those in whom onset of the disease may be appreciated) a high percentage (80.9%) of the cases appear in the autumn months (1, 2, 3, 4, 29, 31, 35, 36, 44).

3) The disease appeared significantly within family groups; this is mentioned in certain case histories (1, 2, 3, 36). In our own series, two patients were siblings and all the other family members displayed moderate eosinophilia of unknown origin (16).

4) Distribution by sex is very similar: 39 were male and 35 female.

5) Though elderly persons (22, 40) and children (2, 9) were included in the case reports, most patients were middle aged.

TABLE 1. — Cases of fascioliasis published in Spain.

Author	Year	Cases	Locality
Martin de la Calle *	1890	1	Sauquillo de Cabezas (Segovia)
Dominguez Rodiño *	1944	1	
Gonzalez Castro *	1944	1	Almuñecar (Granada)
Luengo *	1945	1	
Gonzalez Castro *	1945	1	Chauchina (Granada)
Gonzalez Castro *	1946	1	Almuñecar (Granada)
Alfaro *	1946	1	Teruel
Garcia Baron	1950	1	Santander
Diaz Martin **	1951		
Morell Cuellar **	1951	1	Tetuan
Orduña Prieto	1957	1	León
Beltran de Heredia	1964	1	Valladolid
Gonzalez Castro	1966	1	Granada
Hernandez Guio	1967	1	Toledo
Sastre	1970	1	Segovia
San Julian	1970	1	Villajoyosa (Alicante)
Sarria Diaz	1971	1	Marraquez (Marruecos)
Ponseti	1972	1	Orgaña (Lérida)
Zaragosi Moliner	1972	1	Gandía (Valencia)
Alcoba Leza	1973	1	León
Perez Garcia	1975	1	Cereda de la Sierra (Salamanca)
Gallardo	1976	1	Cazalla de la Sierra (Sevilla)
Pera	1978	1	Badajoz
Aguirre Errasti	1978	7	Bilbao
Cosme	1979	1	Orio (Guipúzcoa)
Campo Hernandez	1980	1	Logroño
Redin	1980	1	Alsasua (Navarra)
Miras Estacio	1981	1	Villalba (Madrid)
Aguirre Errasti	1981	2	Baracaldo (Vizcaya)
Martinez L. Letona	1982	3	Madrid, Vigo, Irún
Noya	1982	2	Santiago de Compostela, Orense
Peña Sanchez	1982	5	Valdemorillo (Madrid)
Pina Arroyo ***	1982	1	Zamora
Ayensa Dean	1983	8	Vitoria
Montejo	1983	1	S. Salvador del Valle (Vizcaya)
Aliaga	1984	1	Pamplona
Ayensa Dean	1984	1	Vitoria
Martinez O. de Z.	1984	1	Bilbao
Campo Hernandez	1984	10	Logroño
Heredia	1984	1	Barcelona
Garcia Rodriguez	1985	6	Barbadillo (Salamanca), Túnez, Salamanca Zamora (3).

* Cited by González Castro (19, 20).
** Both publications correspond to the same case.
*** Serological diagnoses carried out in our Department.

CLINICAL ASPECTS

Symptoms in the acute phase were not strikingly different from those described classically: asthenia, fever, pain in the right hypochondrium and weight loss were primary signs. Many other random signs also appeared such as: a general feeling of poorlines, diarrhoea, a « full » feeling, nausea, vomiting, pruritus, urticaria, etc.

In the chronic phase the clinical picture was more attenuated and confused though the classical pattern could be detected: digestive upsets, pain in the right hypochondrium, cholecystitis, cholangitis, etc., patients also had gallstones (7, 12, 15, 37, 39, 40, 47).

Cases have also been reported in which pleuropulmonary (3, 4, 30, 44) and neurological (1, 10) manifestations or the presence of subcutaneous

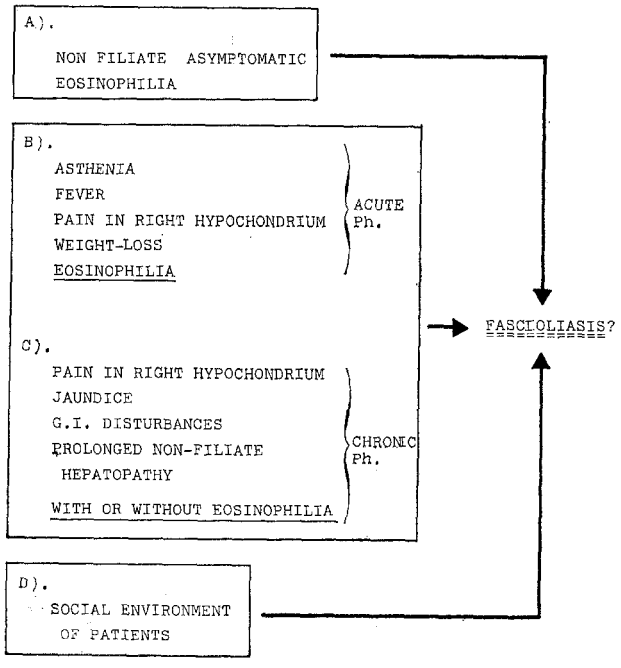
or epidydimal granulomas (1) were suggestive of ectopic localization of the parasite, though this was never confirmed. In the pathogeny of the pleuropulmonary and neurological manifestations the incidence of hypersensitivity mechanisms cannot be ruled out.

Two cases have recently been reported which exhibit hitherto undescribed complications in this parasitic disease (41); these were extrahepatic thrombotic lesions which the authors adscribed to a hypercoagulable state induced by the fascioliasis; however the lack of previous references in the literature and the positive results of serological assays to *Trichinella spiralis* (the only parasite which has been related to processes of hypercoagulation) in one of the cases, leads us to doubt the true aetiology of such complications.

DIAGNOSTIC ASPECTS

According to epidemiological studies carried out in zones of high incidence of the disease, it was observed that the greatest number of diagnoses were obtained from the study of non filiated eosinophilias and of the environments of confirmed patients (Table 2). This kind of study has not been carried out in Spain and the cases which have been diagnosed either displayed a compatible clinical or analytical picture or were obtained in surgical exploration of the common bile duct.

TABLE 2.
Data to be considered on suspicion of fascioliasis.



Accordingly, leukocytosis and eosinophilia were of great orientative help with values of 7000 (2) and 33400 mm. (1) and 33-78% (1, 2), respectively. During the chronic phase, these values were lower: 4400-17000 (41, 43), and 5-52% (41, 43), respectively.

The erythrocyte sedimentation rate was seen to be moderately to significantly high in the acute phase, whereas in the chronic phase it was normal or only moderately high.

Alkaline phosphatases generally showed normal values and in the cases in which they were high (2, 3, 4, 5, 22, 29, 30) no relationship could be detected between them and any particular phase of disease.

G and M immunoglobulins were almost consistently within normal values. In certain recently published cases the study of E immunoglobulins in the acute phase is included; these are consistently high (9, 30, 36).

Biopsy was carried out in 34 patients (45.2%) by laparoscopy or laparotomy and in the acute phase revealed microscopic evidence of abcessing granulomatose hepatitis with necrotic zones surrounded by inflammatory tissue showing a predominance of eosinophils as well as infiltrates of these cells in portal and sinusoide spaces. These are unspecific findings which also appear in other diseases.

Finally, gammagraphic studies were carried out on 30 occasions (40.0%) in 12 of which it was possible to observe focal defects in isotope incorporation (2 were found in the chronic phase of the disease) and diffuse destructuring in 3; no anomalies were observed in the remaining 15 cases.

Diagnostic certainty in the acute phase has only been possible since the introduction of serological techniques. The first reports of such assays were by Sastre (1970) (44). Since then, 13 patients have been diagnosed in this phase of the disease, 8 by immunodiffusion (8, 9, 29); 2 by haemagglutination (4, 30) and 3 by immunoelectrophoresis and haemagglutination (5). This kind of assay was also carried out successfully in other patients already diagnosed (1, 9, 39, 44).

Previously, many cases have been observed in the acute phase, though the disease could not be confirmed until the presence of eggs was observed. Their observation in faeces confirmed diagnosis in 35 patients (46.6%), in three of which they were found in bile (1, 19, 20) and their localization in this fluid was the only diagnostic means in another 4 cases (5.3%) (6, 31, 35, 44).

In 13 patients the parasite was removed from the biliary ducts.

In our series, serological methods were the main diagnostic protocol followed (16). By using the double diffusion (DD) technique as a screen,

the sera which were clearly positive (3 or more bands) were later studied by immunoelectrophoresis (IEP) and haemagglutination (IHA). The result was the diagnosis of 7 patients in 6 of which post-treatment evolution was followed by double-diffusion and haemagglutination. According to the former, negativization of the sera of two of the patients was checked in studies carried out 6 months and 2 years later, respectively; in the other four an important decrease was observed in the number of bands. According to haemagglutination it was only possible to observe negativization of one patient's serum at 1 year. In the other 5 a decrease in titres was observed, though this was only significant in 2 of them.

In Spain, data concerning the evolution of treated patients has only been published recently. In 1984, Aliaga et al (4) and Martinez O. de Zárate et al (30) working with two separate patients reported haemagglutination titres of 1/160 at 3 and 6 months respectively.

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