

Letter from . . . Spain

A deadly oil

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On 1 May 8-year-old Jaime Vaquero, of Torrejon de Ardoz, a Madrid suburb, died after a brief illness characterised by fever and lower respiratory tract symptoms. Two days later five other members of the family and three of their neighbours were in hospital with a similar illness. A week later 100 more had been admitted and four more had died; an epidemic was officially declared. Mainly the younger population was affected, their ages ranging from 5 to 50. All had presented with some or all of the following: a mild-to-moderate fever (38°-40°C), a dry cough, muscular aches and pains, headache, chest pains, dyspnoea, vomiting, diarrhoea, and an itchy rash. No patient had mucous membrane or upper respiratory symptoms or signs.

"Atypical pneumonia"

The disease was labelled "atypical pneumonia," and a fierce debate followed about the causal agent, with heavy betting on the two favourites, mycoplasma and legionella. A barrage of analyses and cultures produced no clues, however, and the epidemic meanwhile had avalanched. The number of cases had doubled overnight, and a newspaper noted that normal Madrid emergency services had collapsed under the onslaught. The Ministry for Health put out a plea for calm, adding that all was under control and there was no cause for alarm. A planeload of antibiotics was flown in from Paris to "eradicate the epidemic." And still the mycoplasma refused to take the blame for the disease even though it had been isolated in a small proportion of patients. Nor could the best efforts of the excellent National Centre for Microbiology, Immunology, and Virology at Majadahonda uncover the legionella. An obscure virus, or even a new organism altogether, was postulated. Three experts in infectious diseases from the United States were called in for urgent consultation, and blood and tissue specimens were sent to Atlanta in the United States and to Glasgow in Britain.

Meanwhile, two cases appeared in far-off Catalonia—two schoolgirls who had been to Madrid on a school trip a few days before developed the disease. By the end of the second week 400 patients had been admitted to hospital with "epidemic atypical pneumonia." Rumours arose that the epidemic resulted from an accidental leak of experimental strains of micro-organisms from the American military air base at Torrejon de Ardoz. People recalled that the father of one of the original nine victims worked at the base, and despite denials of any trace of the illness at the base one young American contracted the disease while on a visit there. Rumblings about secret stockpiles of "biological warfare weapons" increased but were vigorously quashed by the American Embassy. On the other hand, a team of virologists from the centre at Majadahonda complained that they were denied entry to the base.

On 16 May there was the death of a 10-month-old girl—the youngest victim to die so far. In the face of the perplexing failure to isolate the causative organism a host of speculations sprang up. One theory blamed the oxidation of aluminium. Another blamed the drought. In the province of Leon there were fears that the epidemic would spread to the large mining zone there, where 3600 patients with silicosis were registered. The Department of Health officer in Leon, jumping the gun, claimed that psittacosis was responsible for the epidemic and ordered a campaign to clean up all aviaries in the province. Indiscriminate destruction of all types of birds and small animals, including dogs and cats, followed.

"Mycoplasma nothing!"

The theory that achieved a certain notoriety, however, was that of the director of the National Hospital of Infectious Diseases, Dr Antonio Muro. He and his team came out publicly in opposition to the Government's insistence on a mycoplasma as the causative agent. In the absence of any laboratory clues Dr Muro christened the hypothetical organism "laborella," after Labour Day (May being the day the illness surfaced). In a dramatic gesture the doctor inoculated himself and his son with mycoplasma and then proceeded to treatment. He pointed out that the course of the epidemic illness, by contrast, did not seem to be altered by treatment with antibiotics. Dr Muro insisted that fresh fruit and vegetables needed to be investigated, believing the mode of transmission to be at first oral via the digestive tract and later respiratory via the airborne route. "Mycoplasma nothing!" he declared. The Government responded by promptly relieving him of his post.

The Health Officer for Torrejon de Ardoz, Dr Raul Sanz, supported Dr Muro's theories and blamed green vegetables and strawberries directly for the disease, naming suspect districts. After his statements the farmers of Caceres lost 40m pesetas in unsold strawberries in two days, and French importers began boycotting Spanish fruit and vegetables. Indignant, the civil governor of Caceres entertained a group of ministerial delegates to a strawberry dessert at an official dinner. Dr Sanz was obliged to retract his statement later on television (where he appeared eating a plate of strawberries and cream). The number of admissions had now passed the 1000 mark. Despite 150 new cases of the disease each day and 14 deaths the Director-General of Public Health reaffirmed that the situation was completely under control. In a press conference on 21 May Mr Sancho Rof, the Minister for Employment, Health, and Social Security, declared, "We are 99% sure that the agent is *Mycoplasma pneumoniae*" and insisted that any influenza was far more serious than this "outbreak." The lack of supporting evidence was straining the official line, but even as late as 11 June the head of the department of microbiology at a prestigious clinical investigation centre expressed the opinion that "this outbreak of atypical pneumonia is probably of less importance than a flu epidemic in winter."¹

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At one point the solution seemed at hand—a medical man in China offered himself to the Spanish Government, having the fortunate ability, he said, to cure any atypical pneumonia in one minute. Notwithstanding petitions by Spanish diplomatic representatives the People's Republic, no believer in miracles, refused to grant him permission to leave.

"Epidemic interstitial pneumonia"

A full month after the start of the epidemic the State Secretary of Health finally publicly admitted that the illness and its cause remained as mysterious as on the first day. There were now 2409 cases spread over 18 provinces. The disease was rebaptised "epidemic interstitial pneumonia," and a rather tardy bulletin was sent to all doctors with a description of the disease and guidelines on its management. The bulletin² described a typical patient as follows: "A young, previously healthy adult who develops, over a period of two to three days, a fever of 38°-39°C without rigors, a moderate headache, diarrhoea four to five times a day, an urticarial rash over the trunk and extremities, a non-productive cough, significant myalgia, and dyspnoea, whose brother is admitted 48 hours later with the same clinical picture. Examination shows a generally ill, febrile patient in no obvious respiratory distress; pulse is 80-100/min; there is some cervical adenopathy and fine crepitations at the right base." (In 20% of all patients the liver was enlarged, and the spleen was palpable in 10%.) "The chest x-ray film shows a bilateral interstitial pattern, mainly over the middle and lower lung areas, with a profusion of Kerley lines and perhaps a small pleural effusion. Laboratory tests are normal except for high lactate dehydrogenase concentrations. Blood gases show hypoxia, with a P_{O_2} of 68 mm Hg, and a mild respiratory alkalosis."

Meanwhile, German package holiday operators were busy cancelling bookings, and the health and social security officer in Andalusia declared that exaggerated rumours about the extent of the epidemic in Andalusia were part of a deliberate plot to scare tourism away to other places in Europe. The tourist season seemed heading for disaster.

"On tap" olive oil

On 12 June doctors investigating the epidemic held a press conference at the Provincial Hospital in Madrid to draw public and official attention to the more than casual association between outbreaks of the disease and the consumption of unbranded olive oil, uncovered by a detailed epidemiological survey. For more than a week a group of doctors, led by Dr Tabuenca Oliver, disenchanted with the official theory, had been following up this association. Each of the victims of the epidemic shared one thing in common; they were all users of "on-tap" olive oil bought from street vans. Dr Jaqueti, at that meeting, compared the clinical picture of this epidemic with that of similar epidemics in Germany and the low countries some years ago, which were labelled "the disease of the little bullae" and "the margarine disease" respectively. Poisoning by toxic additives into edible oils was found responsible in each case. "We haven't discovered or invented anything new," said Dr Jaqueti; "this is just a clinical intuition based on a study of overseas reports. There's a chance we are on the right track."³ About 80% of children and 57% of adults had produced a hypersensitivity-type rash, and Dr Jaqueti commented on the almost identical skin lesions seen in the Dutch and the present epidemics.

The marketing of bulk olive oil is controlled by law, and only accredited dealers are licensed to sell it. Nevertheless, "illegal" oil is hardly scarce. Many poorer families buy their oil on tap from ambulant vendors, although its sale in this form has been prohibited since 1979. Some of these vendors pass off as pure olive oil a mixture of olive and other vegetable oils (containing up to 60% non-olive oils). Soya oil is the usual adulterant, though sunflower and other seed oils are also popular. Despite

repeated complaints by legitimate dealers the Spanish authorities have never tackled the problem with great energy, and scores of fraudulent companies have got away with paying the occasional small fine. The past president of the Consumers and Users Association estimates that 50 000 tons of adulterated oil are sold to the public every year, making a clear profit of 2000 million pesetas (about £10m).

Fatal cocktail

Initial analyses of oil taken from several patients' households showed gross contamination with aromatic amines, principally aniline and acetylamide. Some of the samples contained 30 mg per litre of aniline dye. The Government put out a statement tentatively linking adulterated oils with the epidemic. With the epidemic in its seventh week, with a total of 42 deaths, and over 8000 people affected, the public thought that perhaps the end of the road was in sight. The Government took advantage of the oil theory to crack down on substandard oils, admittedly belatedly. It was discovered that the other component of the "fatal cocktail" was rapeseed oil, an oil derived from the rape plant, *Brassica campestris oleifera*. There are two sorts, the edible type and the denatured type used in heavy industry. Aniline is commonly added to the denatured oil for industrial use. A recent large importation of denatured rapeseed oil had evidently been diverted for other purposes.

The laboratory at Majadahonda worked round the clock; more toxic additives were uncovered—methylamine, quinoline, azobenzene, methylquinoline, and dimethylquinoline, all of which were known to be used in the denaturing of rapeseed oil. Some bits of the puzzle fell into place—for example, why patients well on discharge from hospital relapsed on returning home, why the outbreaks were confined to the outerlying suburbs of Madrid (where the poorer families lived), why the fathers in the families were affected least (they ate away from home), why serial serum samples never showed any consistent rise in antibody titres, and the failure to isolate a convincing causative organism. But the puzzle has one or two awkward pieces. Why did some of the people who ingested this oil not fall ill? And why did the poisoning present with a mainly pulmonary picture? Typical aniline poisoning tends to produce central nervous system, hepatic, renal, and cardiac symptoms rather than pulmonary ones. None the less, the evidence seems overwhelming. Additional support damning the oil came from a test on two groups of rats, one fed normal oil and the other the adulterated oil. The rats in the second group died with the clinical features of the so-called "epidemic pneumonia" syndrome.

But the epidemic is far from over. Two months after Jaime's death new cases are still appearing. The total number affected stands at more than 10 000 and, at the time of writing (28 June), there have been three more deaths and 85 new admissions. Through ignorance, disbelief, or poverty people are continuing to use the deadly oil.

The story is not over yet.

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References

- ¹ *Diario de Barcelona* 1981 June 11.
- ² Official College of Physicians of Barcelona. *Bulletin*. 1981 May. (Special issue.)
- ³ *AVUI* 1981 June 13.

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