

Short asbestos fibres – are they toxic?

The true “false controversy” of the toxicity of asbestos fibres in France

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Abstract

Since around ten years, historians and researchers in public health analyse the conditions of the production of the scientific knowledge on the health effects of numerous industrial products, in particular asbestos. They show how the industries are succeeding to keep in doubt the toxicity of their products by the way of the researchers whose works they control. This article analyses the genesis of a debate creating again the doubt on the toxicity of the asbestos short fibres and its impact in the collective expertise on the compared toxicity of asbestos fibres of different dimensions, the results of which were publicized in February, 2009 by the French Agency for occupational and environmental health and safety (AFSSET). In a first part, the author studies the development of the "real false controversy", started by researchers paid by the American automobile industry. By the way of the publication of their results in the recognised international scientific journals such studies acquire legitimacy, in spite of the argued critics aroused within the American scientific community. Exported out of this one and its conflicts, the debate is considered as a real scientific question by the French AFSSET experts. The second part analyzes how the collective expertise AFSSET itself is dominated by these researches controlled by the industries. The consequences, both in the field of the production of the knowledge as well as for justice, are discussed in conclusion.

Introduction

The health effects of asbestos have been known for decades (McCulloch, Tweedale, 2008; Thébaud-Mony, 2008). The review of the scientific literature undertaken in 1996 as part of a collective evaluation by INSERM (Institut National de la Santé et de la Recherche Médicale, National Institute of Health and Medical Research), put an end to the 10 year French controversy which pitted scientists co-opted by industry in the Standing Committee on Asbestos (Comité Permanent Amiante, CPA) against a single team from the National Centre of Scientific Research (Centre national de la recherche scientifique, CNRS). Led by Henri Pézerat, this team had since the late 1970s been working on the identification of the mechanism of carcinogenic asbestos fibres (Lenglet 1996). The conclusions of the INSERM report, are without ambiguity: asbestos in all its varieties (amphibole or chrysotile) is toxic, leading to the onset of fibrosis (asbestosis and pleural thickening) and cancer (mesothelioma and lung cancer in particular). However, a debate starting in the United States on the toxicity of short asbestos fibres has managed to again cast doubt on the toxicity of asbestos fibres according to their dimensions.

This article traces the emergence of this debate and analyses its impact on the collective evaluation of the comparative toxicity of asbestos fibres - short, fine and “regulated”, that is to say long, for which the results were made public in February 2009 by the French Agency for Environmental and Occupational Health Safety (AFSSET)².

The American car manufacturers induce a controversy

¹ Thébaud-Mony A. (2010) Les fibres courtes d’amiante sont-elles toxiques ? Production de connaissances scientifiques et maladies professionnelles, *Sciences sociales et santé*, vol.28, juin 2010 Thébaud-Mony A. (2010) Les fibres courtes d’amiante sont-elles toxiques ? Vraie "fausse controverse" sur la toxicité des fibres d'amiante

² Translators note: AFSSET merged with the French Food Safety Agency (AFSSA) in July 2010 to form the French Agency for Food, Environmental and Occupational Health & Safety (ANSES).

In 2003, the Ford automobile company funded a study examining “the reduction of the biological potential of chrysotile asbestos in the conditions of use for brake shoes (Langer, 2003). Relying on the hypothesis according to which the size of the fibre determines the toxicity of the asbestos (a fibre of less than 5µm would be “inert”), the author states that the conditions of use for brake shoes (containing chrysotile) would lead to the exclusive production of short asbestos fibres and thus deactivate the carcinogenic properties of chrysotile.

The demonstration rests on a laboratory reproduction of wear and tear on brake shoes (in the case of sudden braking) and not on the actual observation of the emission of fibres in the usual conditions of break use. In support of his results, Langer emphasises the fact that the epidemiological studies do not show significant excess cancer cases amongst fitters and car mechanics. He therefore advances the hypothesis that the presence of “short fibres” could be an “index” of altered fibres (implying that these are without carcinogenic power), the risk of cancer being reduced or even non-existent.

By invoking the research cited above, the managers of Ford are attempting to split up the health effects of asbestos according to categories of exposed workers. Epidemiology can identify excesses of cancer in the workers of an industry with homogeneous activity and employment stability, which is the case for the industrial production of braking materials. Conversely it is much more difficult to identify an excess of cancer in very heterogeneous groups like motor vehicle mechanics working in garages of a very diverse range of sizes, working conditions and activity. In the case of installation of brake shoes, or their maintenance or replacement when repairing a car, no study of the forms of contamination by fibres of different sizes exists to allow Langer to connect his experimental model with the reality which it is supposed to represent.

Simultaneously, still at the behest of automobile manufacturers, epidemiologists have carried out a statistical ‘meta-analysis’ of the epidemiological studies cited by Langer (Goodman *et al.*, 2004). Their conclusions transform the absence of significant results into an affirmation of non-toxicity of asbestos in the context of repairing motor vehicles. Indeed, they write:

“the epidemiological statistics available show that for jobs like motor vehicle mechanics, the risk of mesothelioma does not increase. Even if certain studies show a weak surplus of lung cancer, the epidemiological statistics do not validate the hypothesis that lung cancer in this occupational group is linked to occupational exposure to asbestos when repairing motor vehicles”. (Goodman *et al.*, 2004: 323)

True false controversy?

The question of surplus cancer associated with asbestos in motor vehicle mechanics, is transforming into a debate which isolates the toxicity of short fibres from the rest of the accumulated knowledge on the toxicity of asbestos fibres and reactivates the controversy about an eventual dimension-threshold of asbestos fibres, below which their toxicity would be insignificant.

This question of the existence of a threshold of toxicity relative to the size of the fibres was in fact resolved twenty years earlier by the study of mechanisms of carcinogenicity in the works on the toxicology and physical-chemical properties of the mechanisms of carcinogenesis (Pézerat, 1984, 2009 ; Lauwerys, 2007). According to A. Picot, himself a toxicologist, ‘Henri Pézerat is one of the first in the world to underline that asbestos, based on its surface activity, creates very active chemical agents in a biological setting [...]. Such a mechanism allows the explanation of inflammatory pulmonary activity (asbestosis) and also the carcinogenic power of numerous varieties of asbestos’

(Picot, 2009: 7). In a critical article on the work putting in doubt the toxicity of chrysotile, H. Pézerat stated in 2009 that the main factor responsible for carcinogenicity of fibres is this physical-chemical mechanism, the so-called “surface reactivity” of the fibre in a biological setting, the size of the fibres and their biological-persistence in the organism being only the complementary ‘parameters’ able to influence the degree of toxicity of the fibres without being determinant of it (Pézerat, 2009)³.

Fifty two international specialists of the health effects of asbestos (toxicologists, epidemiologists, biologists, doctors) all independent of the industry, collectively denounced this placing in doubt of the international scientific consensus (Welch, 2007). On the basis of a very large number of studies cited in their article, they challenge the hypotheses and conclusions of Langer and Goodman’s work, insisting on two points in particular: the difference between the absence of statistically significant results in highlighting excess cancer risk associated with exposure to asbestos and the absence of the existence of the corresponding reality; the necessity of taking into account the findings produced by **all** the scientific disciplines revealing the reality of the incidence of mesothelioma in the population being studied. Even if the usual tools of epidemiology are inoperative when it comes to carrying out studies alongside independent workers or spread out in multiple small and medium-size businesses, the medical literature mentions cases of mesothelioma in automobile workers in contact with materials based on asbestos in their everyday working activity. Situating themselves on the field of the scientific discussion, the article’s authors show the studies cited above do not result from a scientific approach but rather from a syllogism the premises for which are without real foundation:

1. The brake shoes ‘only’ produce short fibres (which has never been shown).
2. The epidemiological studies have not shown an excess of cancer in motor vehicle mechanics (which does not constitute a ‘proof’ of the absence of a link, but rather questions the limits of statistical methods).
3. Therefore short fibres are not dangerous (which constitutes, on such a basis, an unverifiable postulate).

Yet the results of these studies, published in international scientific journals have, as a result, acquired a scientific legitimacy likely to open a debate. Exported beyond the American scientific community and the conflicts occurring there, in particular in the courts (D. Egilman, 2009), this debate takes the character of a real scientific question that the French experts brought together by AFSSET are again going to take into account.

A collective assessment: are short and fine fibres of asbestos toxic?⁴

At the request of the minister of health, a collective assessment was organised by AFSSET in 2008 in reference to two objectives:

- To determine the possibility of characterising the spread of different types of fibres according to the circumstances of exposure (occupational and environmental).
- To evaluate the human health risks for exposure to short and fine asbestos fibres.

First the experts asked: what is a ‘short fibre’? The answer to this question shows that it is the measuring device and not the potential toxicity which defines, according to the rules, what short, long

³ See references 25 and 26.

⁴ In this article, the discussion focuses on the short fibres, fine fibres being without exception considered as pathogenic in the assessment of AFSSET.

and fine fibres are. Established by consensus in the 1960s, the definition of fibres, according to the WHO, corresponds ‘to the limits of the method of analysis employed in this period’, namely what the optical microscope can identify: any fibres of a length greater than 5 µm. The experts brought together by AFSSET thus keep the definition that a fibre of lesser length than 5 µm is a ‘short fibre’.

In response to the first objective, the experts note that the French figures on exposure to fibres of different are almost non-existent. A ‘re-analysis’ by the Mayor of Paris’ Laboratory of inhaled particles (LEPI) of hundreds of surveys of air sampled in the Ile de France region and Upper Corsica⁵ (asbestosis-exposed areas) allows us to establish that short fibres represent 40 to 100 percent of the level of fibres in environmental exposures. At the request of AFSSET, LEPI acquired surveys of occupational environments in different sectors of activity (asphalt, removal of asbestos, asbestos cement, breaks, mines, recycling, textiles) from the survey bank of the Research Institute for Health and Safety at Work (IRSST) in Quebec. In the surveys, the proportion of short asbestos fibres varies between 87 percent (textiles) and 96 percent (removal of asbestos). In the brakes sector, the proportion of short asbestos fibres is 93 percent. According to Tomatis (an Italian researcher working for more than ten years as director of the International Centre of Research on Cancer), in the studies taking into account the reality of exposures in different occupational environments, fibres of all sizes are found in the surveys, short fibres representing up to 90 percent of the burden of asbestos fibres (Tomatis *et al.*, 2007, not cited in the assessment of AFSSET).

The AFSSET report nevertheless indicates that the brakes sector is ‘known for its proportionally higher exposure to short asbestos fibres than other sectors of activity’ (AFSSET, 2009: 190). This ‘evidence’ is not associated with any specific reference. Toxicological studies on the mechanisms of toxicity of fibres in a biological setting are mentioned but in juxtaposition with other works carried out in biology and without researching the coherence and the contradictions between the results obtained in the different studies. The experts of AFSSET adopt a position which reflects doubt, whilst positing a lesser toxicity for short fibres:

“The direct or indirect toxicity of short fibres remains difficult to assess but cannot be excluded. In the hypothesis of a toxicity of short fibres, it would certainly be less than those of long fibres, but no balanced conclusion is discernible at the current time”. (AFSSET, 2009: 82)

In reference to the second objective, the evaluation of international epidemiological studies essentially relies on the meta-analyses of Goodman *et al.* (2004). The epidemiological studies showing the existence of cases of mesothelioma amongst motor vehicle mechanics are considered by the experts as being ‘of a weak level of scientific evidence’ (AFSSET, 2009: 191). Amongst these figure the works of James Leigh, who has led the Australian national register of mesotheliomas for more than twenty years and identifies cases of mesothelioma in auto mechanics for which the sole source of exposure to asbestos was repairing brakes (Leigh and Driscoll, 2002; 2003). As for the researchers having taken a stand so as to highlight the scientific incoherencies of the placing in doubt of the toxicity of short asbestos fibres (Welch *et al.*, 2007), they are not cited in AFSSET’s report.

In the conclusion of the collective assessment, the experts recognize that: ‘The toxicity of short asbestos fibres, evaluated from an epidemiological point of view, cannot be ruled out, although some consider this to be unproven’, but they consider that ‘the existence of a significant but weak, effect of short asbestos fibres appears to be a conservative hypothesis.’ (AFSSET, 2009: 213). The

⁵ Translator’s note: the Ile de France region includes Paris, its greater metropolitan area and some of the surrounding countryside. Upper Corsica, Haute Corse, is the northern part of the island.

recommendations presented in the report are to monitor the presence of short asbestos fibres in the general environment, but not to modify the current norms of monitoring in occupational settings by refraining from counting short asbestos fibres there. New studies are suggested in each scientific area, along with an ‘old bibliography’.

Conclusion

This episode in an age-old story of the health effects of asbestos is symbolic of the instrumentalisation of scientific doubt in the maintenance of situations of risk (McCulloch and Tweedale, 2008). From the difference in toxicity of different types of fibre to the myth of controlled usage, from the bio-persistence of chrysotile to the differential toxicity according to the dimension of fibres and the absence of significant results in the negation of excess cancer in such or such an exposed population group, doubt always remains possible, delaying all the more the political decisions indispensable to the prevention of asbestos cancers. Two years after the AFSSET report came out, the French regulations have not been modified whilst the asbestos removal sites multiply and allow a heavy threat of exposure to asbestos, all types of fibres taken together, for the workers employed on these sites.

On the international level, this somewhat insidious return to questioning the toxicity of asbestos regarding short fibres reinforces the return of the asbestos market. In India and in China the consumption of asbestos has been increasing strongly since the beginning of the 2000s. Recently, the new Quebec government has finally decided not to grant an Indian consortium, led by Belcorp, a guaranteed loan of 58 million Canadian dollars (41.6 million Euros). It was up to the Indian company to find the remaining capital from other investors, in preparation for the re-opening of the Jeffrey mine, situated in the town of Asbestos in Quebec. Naturally this production was destined... for export to the countries, such as India or China, where social rights and environmental regulations provide very little health protection. In Turin, a criminal judge condemned Stephan Schmidheiny, former CEO of Eternit Switzerland and Louis Cartier de Marchienne former CEO of Eternit Belgium to 16 years jail, for having knowingly produced asbestos, when the health effects had long been known, and thus causing the deaths of thousands of Italian victims. When will we get the creation of an international criminal court of labour and the environment which would bring judgement against those responsible for this deliberate endangering of the life of the other on a global scale?

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