ASBESTOS INTERNATIONAL ASSOCIATION
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MEMORANDUM

TO: Medical Advisory Panel
Communications Advisory Panel
Executive Committee
Mr. F. Baunach

OUR REF.:
AIA/4/4/PR

FROM: Director General

25 March 1985

Statements and Comments

Dr. Brian Commins has recently forwarded his observations (dated 12 March 1985) on eight of the nine "Statements and Comments on those Statements" dated 7 February 1985.

T.K.S.

Sir Neville Stack

cc Dr. B.T. Commins (without enclosure)

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APR 1 1985
H. C. LEWINSOHN

S/C 1. 'One asbestos fibre can kill'

There is no evidence for this whatsoever. Only when very large doses of asbestos, probably representing at least many,many thousands of millions of fibres are inhaled over a period of time, does there appear to be a health risk; in contrast, there is no firm evidence that ingested asbestos, whatever the dose, is harmful. When asbestos fibres are inhaled, depending on their size, a number will become deposited on the surfaces within the lung. We have defence mechanisms in our body which seem to be capable of clearing from the lungs many of these fibres. In any case, human beings are generally capable of tolerating minute doses of many substances; the dose represented by a single asbestos fibre deposited in the lung is absolutely minute (perhaps 10^{-9} to even as low as 10^{-17} g.). A worker heavily occupationally exposed to asbestos could inhale well over a billion (10^{12}) asbestos fibres in his life; even the general public who often will be breathing in several thousands of fibres per day, might have inhaled a hundred or so million fibres in a lifetime. Thus it is hardly feasible that one single asbestos fibre, in addition to the huge numbers of others we normally inhale, could have any specific impact. Indeed if every inhaled single fibre could kill, because of the ubiquity of asbestos and the very large number we all inhale, the human race could not possibly survive.

The suggestion that one asbestos fibre can kill seems to be no more logical than saying one whiff of somebody's cigarette can kill, or that one speck of dirt inhaled from the air can kill.

S/C 2. 'Only asbestos fibres cause mesothelioma'

Firstly, there is no evidence that ingested asbestos has caused mesotheliomas under any conditions of exposure; inhaled asbestos however (mainly associated with heavy exposure to amosite and crocidolite) can cause mesotheliomas. Secondly, a number of inhaled non-asbestos mineral fibres, including natural ones have been shown to produce mesotheliomas in animals and the inhalation of one (fibrous erionite) in natural circumstances in some villages in Turkey, is strongly associated with the disease in people living there. Lastly, a proportion of mesothelioma cases have no known cause and seem to be quite unassociated with specific exposure to asbestos or indeed other mineral fibres.

S/C 3. 'All asbestos fibres are equally dangerous'

Firstly, there is no firm evidence that fibres whatever their size and type, are dangerous when ingested under any conditions of exposure. Inhaled asbstos fibres which deposit in the lung, when they are longer than about 5μm seem to be potentially more hazardous than shorter ones, the latter having a greater probability of being cleared by the lung's normal clearance mechanisms. Fibres with diameters greater than 3μm have a very low probability of reaching the depths of the lung to cause any effects. Fibres less than 0·25 μm in diameter and greater than 8μm long appear to be the more dangerous in terms of possible cancer risk; there is however no sharp demarcation in size, and long fibres with diameters up to 1·5 μm may also be implicated. The evidence for a health risk associated with any form of inhaled asbestos is almost exclusively related to heavy occupational exposure particularly in the past. For the general public, there would seem to be no firm evidence that they are at risk as a result of them inhaling present day levels of any type of asbestos (in general the fibres in environmental air are often shorter than in occupational situations and hence they are likely to be less hazardous anyway). In the past however a few cases of mesothelioma were recorded and these were thought to be caused by excessive exposure to asbestos (mainly amosite and crocidolite)

* Please note that Statement/Comment Nos. refer to the Nos. on "Statement & Comments on those Statements" ref. AIA/4/4/PR dated 7 February 1985.

near factories etc., or inside their homes (workers bringing home the dust on their workclothes). From occupational studies, lung cancer particularly for smokers, would appear to be associated with all forms of asbestos; in contrast, for mesothelioma, the risk seems to be much more associated with amosite and crocidolite asbestos, rather than the more commonly used chrysotile.

S/C 4. 'Inhaling asbestos causes lung cancer'

Lung cancer has occurred in asbestos workers after many years of heavy exposure to asbestos. In these occupational situations, the risk however from lung cancer has been found to be greatly multiplied in asbestos workers who smoke. It is thought that the asbestos may have helped to promote the carcinogenic activity of the tobacco smoke, much of the latter material being trapped in the parts of the lung where lung cancer develops. There is no firm evidence whatsoever that lung cancer has been caused by the inhalation of asbestos fibres in non-occupationally exposed persons whether they smoke or not.

S/C 5. 'Ingested asbestos causes cancer'

Asbestos can be ingested either directly at the same time as it is inhaled, or indirectly when some inhaled fibres are cleared from the lung after being trapped there. Thus the ingestion of asbestos occurs during inhalation in occupational and environmental situations, but additionally when we consume food and drinking water containing small amounts of asbestos. There is no firm evidence in occupational exposure situations that cancer arises from ingesting asbestos. Similarly, for the general public, based on human epidemiological studies and on massive dose feeding studies in animals, ingested asbestos has not been demonstrated to cause cancer. If there is any possible risk at all from ingesting asbestos by the general public, it would appear to be at most, exceedingly low.

S/C 6. 'Children have developed mesotheliomas from asbestos exposure'

Many studies have demonstrated that mesotheliomas usually occur later in adult life often associated with a history of many years of heavy exposure to asbestos (the disease seems more often associated with exposure to amosite and crocidolite, rather than to chrysotile). Although there are some very rare cases of childhood mesothelioma, there is no firm evidence that these have been caused by asbestos exposure; other factors such as radiation, viruses and certain organic substances may possibly have been involved in such cases. Although there would seem to be no intrinsic reason why children should be specially sensitive to mesothelioma, very heavy exposure at an early age could perhaps increase the probability of mesotheliomas developed much later on in life if the total lifetime exposure was sufficiently great,(the age of onset of exposure is considered to be significant).

S/C 8. 'The general population is at risk from asbestos'

Firstly, there is no firm evidence that asbestos ingested in food or water, or indirectly after the inhalation of fibres, has caused the development of cancer or any other diseases in humans. Secondly, there would seem to be no firm evidence that the general public is at risk from developing cancer or any other disease as a result of inhaling asbestos fibres nowadays. This contrasts sharply with the situation of heavily exposed asbestos workers of the past in whom diseases have occurred where their lifetime exposures were perhaps 10,000 to 100,000 times higher than for the general population even where the latter may happen to be exposed to somewhat elevated levels of asbestos inside some buildings (eg. schools). However in the past, a few cases of mesothelioma were found in the general population.

The cases appeared to be associated with exposure to high levels of asbestos dust (mainly where amosite or crocidolite was present) in the air near factories, etc., or inside people's homes brought there by family members on their clothes after working at an asbestos factory. Because of our better understanding of the problem and the means of combating it now, such possibilities of exposure would seem to be very remote. If there is a risk from inhaling asbestos in environmental air (no risk has in fact been proven), it would appear to be very low; the lifetime risk is almost certainly at a rate of less than 1 in 100,000 , such a level being an acceptable risk figure and indeed compatible with the levels of very low risk associated with many other day to day risks which exist in society today.

S/C 9. 'There is no threshold-level for asbestos-related diseases'

In the case of asbestos exposure we are not certain of the mechanisms by which it acts as a carcinogen but it is probable that it involves a multi hit, multi stage process. Thus the small dose represented by say a very low exposure to asbestos may not by itself be enough to initiate a carcinogenic reaction and in any case body defence mechanisms are often adequate to combat small doses of a number of environmental substances. Also,we know that asbestos by itself has a much smaller effect than when it is in the presence of tobacco smoke to produce lung cancer in workers occupationally exposed to asbestos. Thus asbestos exposure per se in relation to cancer is not perhaps incompatible with some threshold concept albiet at some rather low level. It is absolutely impossible to try to predict the dose level at which a threshold could perhaps exist and it is very probable that any threshold would be a function of the form of cancer eg. lung, or mesothelioma of the pleura and peritoneum as well as individual sensitivity. In the case of asbestosis it would appear to be extremely likely that this is a function of a more sizeable threshold. For this disease to occur at all it is almost certain that it requires a very heavy and very prolonged dose before the disease manifests itself; this is in line with the development of various diseases described as pneumoconioses which includes asbestosis.

AIA/4/4/PR

12th March 1985

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