Perspective

Health surveillance for former asbestos exposed worker: a specific programme developed in an Italian region

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Abstract: Asbestos-related diseases usually have a long latency since first exposure and this legitimates a health surveillance programme addressed to asbestos workers after the cessation of their occupational exposure. After a brief history of health surveillance initiatives performed in Italy as well as in other countries, we describe a regional programme for former asbestos-exposed workers, focusing on organizational features. A regional group of experts defined its operational and economical aspects. The Regional Council supported the whole programme, making it free of charge for all subjects who fulfil the predefined enrolment criteria (being resident in the region, being younger than 80 years old with cessation of occupational asbestos exposure within the last 30 years). The programme activities are classified in two levels: a first level for a basic health evaluation and a second level for in-depth analyses. In order to guarantee an homogeneous delivery in the whole region, the programme has to be performed by public health services with a quality control of activities. The involvement of specific public health services and the cooperation of social stakeholders are expected to play a major role in overcoming still open critical issues, such as the lack of programme existence awareness and adhesion, the correct stratification of subjects for the follow-up, and the real homogeneous delivery of the health surveillance in whole region.

Keywords: Health surveillance; asbestos; occupational exposure

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Introduction

Asbestos is a well-known carcinogen since the mid 60's (1) and it was classified as a certain carcinogen to humans by the International Agency for Research on Cancer (IARC) at first in 1977 (2) and subsequently confirmed in updated revisions of scientific literature in 1987 and 2012 (3,4).

In Italy a complete ban of asbestos use is in force since 1992 (national law No. 257). Asbestos-related diseases, either non-oncologic or oncologic, usually have a long latency time that accounts for a health surveillance of subjects with previous occupational exposure to asbestos.

In Italy, where a Beveridge welfare state provides health care to all citizens within its public health service, several health surveillance initiatives for former asbestos workers have been carried out by public occupational health services (OHSs) in some areas, especially where hundreds of workers employed in firms using asbestos in their industrial activity in the past were registered (5-7). The procedures used by the local OHSs were inhomogeneous and without coordination in areas characterized by the same health administration. Similar experiences were also described in other countries (8-11).

In 2012 the Italian Ministry of Heath organized the second Italian Asbestos Conference (12) and at the same time it funded several projects regarding prevention and mitigation of asbestos risk, including a project aiming to define and test a specific protocol for health surveillance of

former asbestos workers to be later implemented in whole Italy. Eighteen Regions and Provinces joined in the project. A consensus document was draft (13) and it is now under evaluation by the Italian Minister of Health.

In Tuscany, an Italian region in Central Italy, after having experienced initiatives similar to those abovementioned, an in-depth examination of several aspects (organizational, economical, etc.) of a public health surveillance programme for former asbestos workers was conducted (14). The Regional Council then decided to put it in practice assigning specific regional funds, and ratified its decision (Deliberation of the Tuscan Regional Council n.396/2016) according to a previous regional law (Law n.51/2013). Aim of this paper is to describe the main clinical and organisational features of the regional programme of post occupational health surveillance for former asbestos workers.

The definition of a protocol for health surveillance of former asbestos workers

In defining a protocol for health surveillance for former asbestos workers the first need to be addressed is the inclusion of evidence-based procedures and financial sustainability. The literature on previous experiences on this issue and, in particular, the revision and following recommendations reported in the updated Helsinki Criteria document (15) were useful to define the Italian protocol. It pays particular attention to diagnosis and care for non-malignant asbestos diseases in subjects with a reliable work history of exposure to asbestos.

The Italian protocol includes two possible sequential phases of health evaluation: a first and a second phase, for a basic and an in-depth health evaluation respectively.

During the first phase the occupational health physician (OHP) defines the past occupational exposure to asbestos and the presence of all enrolment criteria for the examined subject. Then, for those entitled, the OHP:

- Collects his/her physiological anamnesis, medical history, and evaluates possible signs and symptoms of asbestos-related diseases;
- Prescribes a chest radiograph and its interpretation in accordance with the International Labour Organization (ILO) system for classification of pneumoconiosis;
- Prescribes a spirometry including flow-volume curves;
- Administers the European Coal and Steel Community (ECSC or CECA) questionnaire for the diagnosis of chronic bronchitis and the *Medical Research Council (MRC)* questionnaire for the evaluation of dyspnoea seriousness.

The second phase examination is applied, if needed, only for more in-depth evaluation of the health status of the subject in order to confirm doubts concerning the diagnosis of an asbestos-related disease, in cooperation with other health services/professionals (radiologists, pulmonologists and others). In particular, computed tomography (CT) examination is performed in order to evaluate pleural plaques and parenchymal abnormalities according to the International Classification of High resolution CT for Occupational and Environmental Respiratory Diseases (ICOERD).

The protocol does not include a low-dose computed tomography (LDCT), suggested to be useful for the diagnosis of lung cancer in heavy smokers (16). As recommended by the cited Helsinki Criteria document (15) "*at this time there is limited evidence to guide risk estimation and LDCT screening in workers at high risk for lung cancer due to asbestos exposure with or without a history of smoking. However, … it is reasonable to recommend that adults with asbestos exposure be evaluated for eligibility for lung cancer screening*", that unfortunately is not organized in any Italian area, as well as those related activities as quality control, collection and analysis of all data on benefits, complications and economic issues. This recommendation was also confirmed by the 3° Consensus Conference of the Italian Association of Medical Oncology (17).

As in any health surveillance programme, a follow-up is foreseen. It was defined ending 30 years after the last occupational asbestos exposure. Its periodicity depends on the level of exposure intensity: 3- or 5-year follow-up for a healthy subject with respectively medium-high and low former asbestos exposure and 1-year follow-up for a subject affected by a non-malignant asbestos-related disease, in order to evaluate and reduce the possible progression, as proposed by the Helsinki criteria document (15). Patients diagnosed with a malignant asbestos related disease are promptly taken in charge by public health care programmes for cancer patients. Particular attention is paid to those with documented lung fibrosis who are also invited to undergo influenza and pneumococcus vaccination, and to current smokers who are invited to quit in order to reduce the possible risks of lung disease, deterioration of their lung function and progression of radiographic fibrotic processes, if applicable.

If an asbestos-related disease is diagnosed, insurance and legal processes have to be implemented by national

regulation, sending notification of the occupational disease to the Italian Workers' Compensation Authority (INAIL) (DPR 1124/65, article no.139) and to the officer of justice (Italian Justice law article no.365 c.p. and no.334 c.p.p.).

The above-mentioned health surveillance programme does not allow a primary prevention because the exposure took place in the past and at the same time it does not allow any secondary prevention in its strict term because it is not a real screening programme. The aims of a health surveillance programme for former asbestos workers, for its ethical and social characteristics, are summarized as following: (I) to correctly identify past occupational asbestos exposures; (II) to correctly identify non-malignant asbestos-related diseases; (III) to inform the former exposed workers about the risk related to their previous and current exposures, including other occupational exposures and smoking habit, that could enhance fibrotic processes; (IV) to certificate, if applicable, work-related diseases to claim compensation. The promotion of further epidemiological study on health impact of asbestos at regional level can be added as an indirect aim of the programme.

The health surveillance program for former asbestos workers in Tuscany, Italy

After the definition at national level of an health surveillance programme for former asbestos workers in terms of evidence-based procedures, efficacy and social utility, the public regional health administration asked a group of experts to evaluate in-depth those aspects not considered in the national consensus document, focusing in particular on the standardization of past asbestos exposures, the communication issues and the economical sustainability (14). On April 2017, the programme started after a deliberation of the regional council that supplied specific funds for it.

In order to guarantee a homogeneous health surveillance in the whole region, the Tuscan programme includes:

- Operational plans, one for each area (North-West, Centre and South-East) where a local health administration has to organize and manage the specific health services for the programme;
- A continuous training of the involved health professionals;
- A regional technical coordination group;
- An evaluation and monitoring plan of the performed activities;
- A cooperation agreement with unions and association of former exposed workers.

Only subjects resident in Tuscany, aged less than 80 years, retired or still working in a plant different from that where the exposition took place in the past and whose exposure is certified by a public OHP, are included in the free of charge programme. For those still working in the plant where they were exposed to asbestos, Italian law prescribes that the health surveillance is in charge of the private occupational physician of the firm. Based on the compliance obtained by the local previous experiences on 4,000 former asbestos workers, it was estimated that almost 5,600 former exposed asbestos workers fit with the criteria mentioned above and will be involved in the programme (14). This estimation was based on the individual data regarding workers in Tuscan asbestos firms involved in an Italian multicentre cohort study (18,19). Currently, 1,330 are the former exposed asbestos workers taken in charge during the previous cited local initiatives and 3,619 are further identified subjects.

Specific clinical practices of public OHSs have been opened all over the region, differently scheduled in relation to the estimated amount of past asbestos workers in each area. Only three occupational health departments provide in-depth health evaluations, one in each area considering that only one-forth of subjects will need a clinical in-depth study and only half of them will need a 1-year follow-up (*Figure 1*). Subjects with a history of asbestos exposure at the workplace will be directly invited to the OHSs, but if a subject thinks to have undergone asbestos exposure at work can directly contact the local OHS for an examination in the same clinic.

All the information gathered during the clinical examination will be registered in a specific database for preventive regional activities.

The end of the regional health surveillance programme was defined at most in 2024, 30 years after the implementation of the complete asbestos ban in Italy in year 1994, in relation to the subjects' enrolment criteria mentioned above. It is expected in time to reduce the number of former exposed workers included in the programme because of loss of enrolment criteria (aged 80 years old and more, 30 years and more since the cessation of exposure) but at the same time an increase of second phase examinations for subjects with lung diseases with a 1-year follow-up.

Discussion

In Italy, from the end of the Second World War to the asbestos ban in 1992, there was a widespread use of asbestos in many industrial applications with thousands of workers exposed,

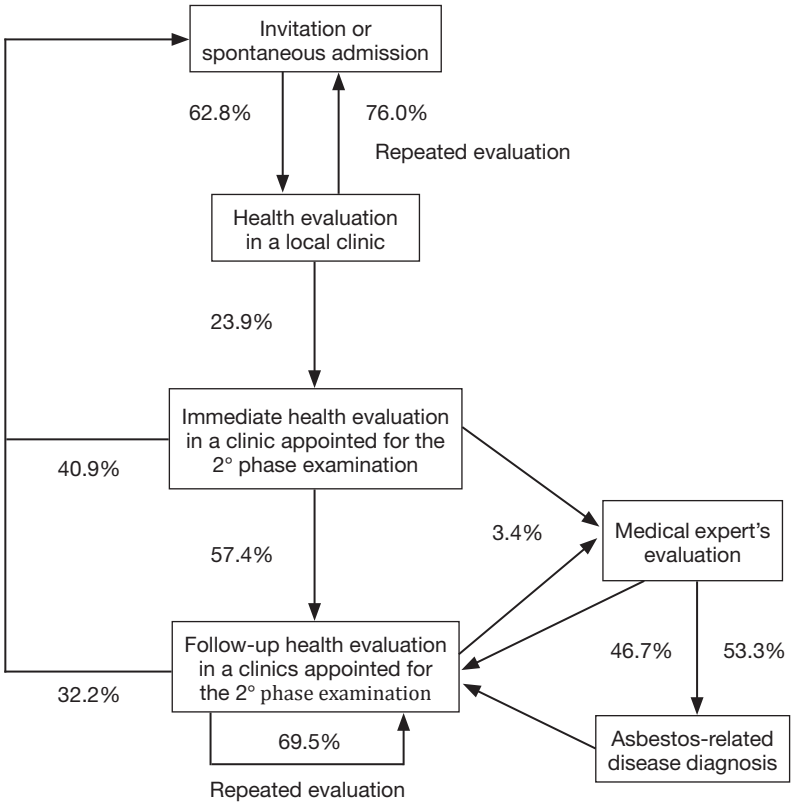

Figure 1 Health surveillance programme for Tuscan workers with past asbestos exposure: adhesion and progression estimates based on previous experiences (14).

especially between the 1950's and 80's. Considering only the asbestos production, 3,748,550 tons of raw asbestos were produced in Italy, with a peak between 1976 and 1980 (20).

Nowadays, in Italy, there is a high perception of health risk related to past asbestos exposure either for the prevention activities carried out since 80's either for the trials conducted in the last two decades regarding environmental disasters potentially produced by asbestos industries and their health impacts on workers and residents in the surrounding areas. A national mesothelioma register is active since 2003 (21), based on regional collection and evaluation of their exposure history to asbestos, some of them active since the end of 80's (22,23).

The health surveillance of formerly exposed asbestos workers is legitimated by the long latency of asbestos related diseases. This is the reason why great attention and initiatives have been registered in many European countries, beside Italy. Two reviews on international and Italian experiences on health surveillance programmes for subjects with past occupational exposure to asbestos were published by Italian researchers, the first one covering the years 1969–1996 (5) and the second one on further experiences both international and national during last decade (7). Asbestos health monitoring guidelines were published by the Spanish Health Minister in 2003 (24) and by French Haute Autoritè de Santè in 2010 (25). In Italy a consensus document developed by experts was developed in 2012 (13) after several experiences carried out in the previous two decades (5,7,26-33). Anyhow, official specific recommendations of the Italian Health Minister are not available yet. The 2001 Constitutional Reform in Italy gave regional Administrations exclusive authority in execution-level planning and delivery of health care, besides guaranteeing the core benefit package (LEA) to every citizen that are determined at national level and must be equally provided by every Region. Therefore, in Italy at regional level organizational decisions on this issue are going to be taken in order to give an answer to social and ethical requests: asbestos information desk (34), and specific regional health surveillance programmes in 2016 (35,36).

In Tuscany, an organization of public health services devoted to this surveillance was defined, based on the national recommendations, characterized in terms of efficacy, suitability, social utility and economical sustainability. All these characteristics allowed to offer the programme free of charge within the regional public health services with the involvement of preventive (OHSs, antismoking services) and care services (unit of radiology and unit of lung diseases).

Nevertheless, still open questions need further discussion, study evaluation and management, such as a diffuse knowledge of the surveillance service for all those who could benefit from it, the correct stratification of subjects for the follow-up and its usefulness, the real homogeneous delivery of the surveillance in the whole region.

The ability to solve the first question rely on several aspects: (I) the knowledge on asbestos exposures of the health professionals, first of all the General Practitioners, who can inform the past asbestos workers; (II) the support of professional associations; (III) the support and communication activity of no-profit association of workers formerly exposed to asbestos and Unions (the specific agreement signed at regional level might contribute to establish an active cooperation). It is in fact necessary to identify all subjects with a past occupational asbestos exposure and therefore to invite them directly to the clinics.

Regarding the second question, the stratification of subjects in relation to the intensity of their past occupational exposure is still under discussion: it is difficult to estimate it *a posteriori* especially when workplaces are not well known and/or are no more in activity; at the same time it depends on the knowledge of the OHP regarding past occupational asbestos exposures in the specific workplaces where the examined subjects might have been exposed. Moreover, it must be pointed out that the intensity of exposure is mainly related to lung cancer risk.

The third question relies on the correct standardization of the procedures all over the region, based on a high quality and effective training of all the involved professionals who are expected to actively exchange their experience and problem-solving activities. The new regional health system organized in three areas (North-Western, Centre, South-East) could facilitate this standardization. The ability to perform an homogeneous surveillance system relies also on the monitoring and evaluation procedures that are going to be implemented within the programme and are continuously under discussion by the specific regional group of experts and all the stakeholders.

At the end it must be mentioned also the ability to collect and produce adequate documentation in case of identification of an asbestos disease for the Italian Workers' Compensation Authority, allowing compensation in response to individual workers' claims, and whose benefits are granted to the subjects themselves or to their relatives. The claims can be indeed rejected for inadequate documentation on occupational exposure to asbestos and/or on disease diagnosis. The continuous and exchanged training activity among involved professionals, previously mentioned, is expected to increase their ability to correctly identify the past occupational exposure and the diseases of interest.

In conclusion, the identification of a specific public health surveillance programme for former asbestos workers including training and monitoring activities and the cooperation of professional and social stakeholders might facilitate to overcome still open problems as the lack of a diffuse knowledge of the service with a broaden invitation to adhere to the programme, the correct stratification of subjects for the follow-up and the real homogeneous delivery of the health surveillance in the whole region.

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Footnote

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