Silicosis has not gone away

Silicosis in Spain: a 2016 point prevalence overview in employed workers

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Background

- Silicosis is an occupational lung disease caused by inhalation of crystalline silica dust.
- Despite the advances in both diagnosis and prevention the prevalence of silicosis is still high, specially in non developed and developing countries, but also in developed/industrialised countries
- In Spain, several outbreak studies have been published[1-3] in the last years, but no systematic epidemiological studies have been performed up to date.

1.- Martinez C, Prieto A, García L, Quero A, Gonzalez S, Casan P. Silicosis: una enfermedad con presente activo. Arch Bronconeumol. 2010; 46:97-100.

2.- Pascual S, Urrutia I, Ballaz A, Arrizubieta I, Altube L, Salinas C. Prevalence of silicosis in a marble factory after exposure to quartz conglomerates. Arch Bronconeumol. 2011;47(1):50-1

3.- Pérez-Alonso A, Córdoba-Doña JA, Millares-Lorenzo JL, Figueroa-Murillo E,García-Vadillo C, Romero-Morillos J. Outbreak of silicosis in Spanish quartz conglomerate workers. Int J Occup Environ Health. 2014;20(1):26-32

Background

- 4 Laboral Advanced Radiology is a company that provides on-site x-ray imaging and silicosis monitoring to spanish companies with silica-dust exposed workers

Objectives

The aim of the present study is to explore the point prevalence of silicosis in Spanish industries and activities with a specific occupational risk.

Methods

- We performed an **observational, cross-sectional, descriptive study**

- 2987 employed workers were explored according the specific silicosis Spanish protocols .
  - Different industries and activities with silica-dust exposure were included.
  - Ages ranging 18-65 years.

- Two chest radiography (posteroanterior and lateral) were taken for each individual **in the place of work using a mobile x-ray** unit mounted on a truck. Data gathered during 2015

Methods – Image evaluation

- X-ray images were evaluated by three different readers, as stated by ILO
- Profusions 0/- and 0/0 were considered as normal.
- Profusions 0/1 and 1/0 were considered as abnormal non-silicotic.
- **Silicosis was defined (according to international protocols) by profusions of at least 1/1.**

Results

Table 1. Number of explorations by type of industry				
Industries		**N. employees**		
Extractive	Surface mining		814	
	Deep mining		192	
		Subtotal		1006
Applied	Foundry		500	
	Tile		440	
	Quartz agglomerates, Marble works and Construction		473	
	Other industries		376	
	Cement and concrete		192	
		Subtotal		1981
		TOTAL		2987

Results

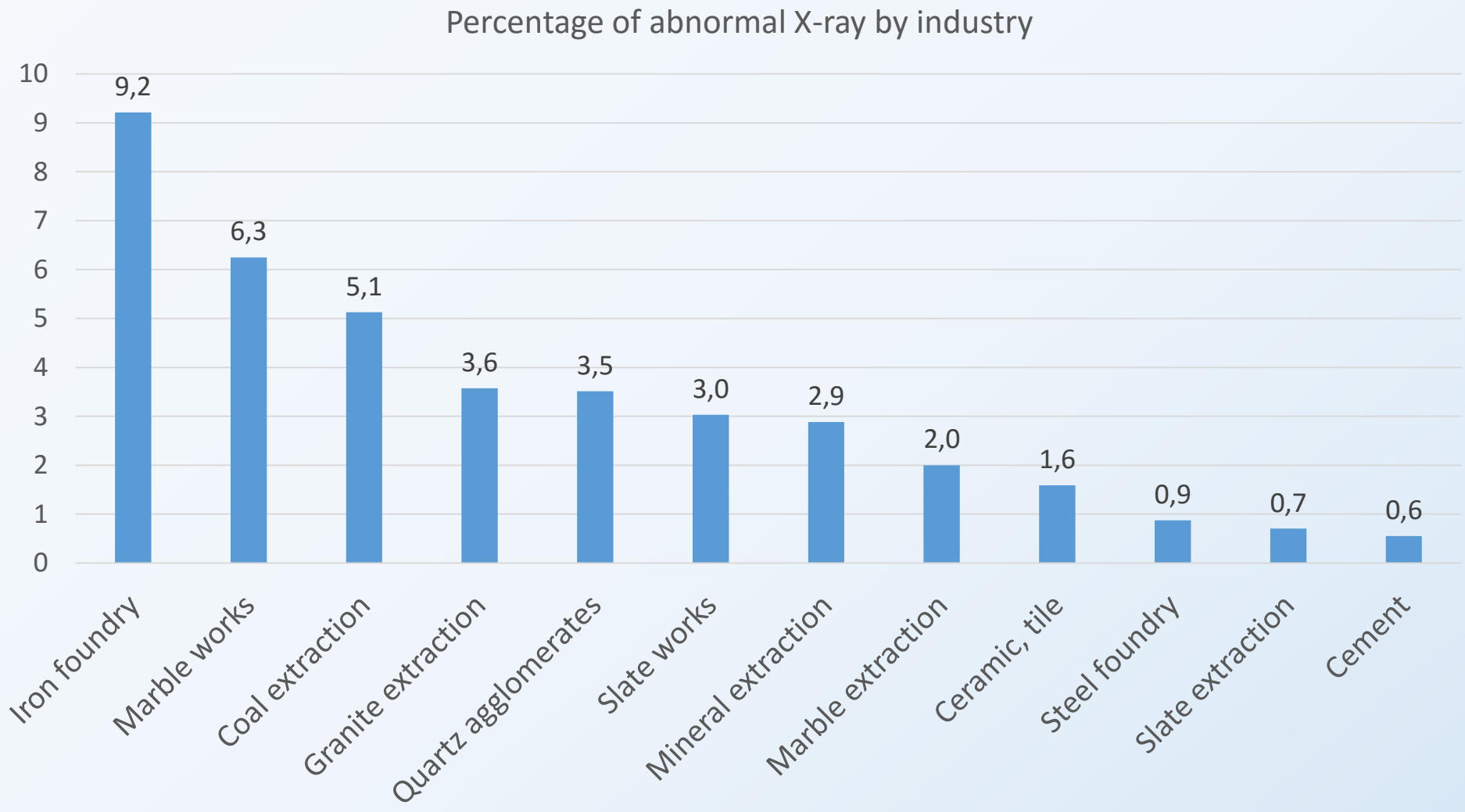
Table 2.- Abnormal cases by profusion			
Category (ILO)		N. cases	Classification
Small opacities	Large opacities		
0/1		13	Abnormal non-silicotic
1/0		25	Abnormal non-silicotic
1/1		10	Silicosis positive
1/2		4	Silicosis positive
2/1		0	Silicosis positive
2/2		4	Silicosis positive
2/3		0	Silicosis positive
3/2		0	Silicosis positive
3/3		3	Silicosis positive
	A	0	Silicosis positive
	B	1	Silicosis positive
	C	0	Silicosis positive
		38	Non-silicotic
		22	SILICOTIC
		60	TOTAL

It is worth noting that we found 3 individuals with high profusion (3/3) and even a new case of large type B opacity

Results

Punctual prevalence of abnormal images and silicosis		
	Number	Percentage
X-ray explorations	2987	100%
Abnormal non-silicotic	38	1,27%
Silicotic	22	0,74%

Results


Percentage of abnormal X-ray by industry
10
9
8
7
6
5
4
3
2
1
0
9,2
6,3
5,1
3,6
3,5
3,0
2,9
2,0
1,6
0,9
0,7
0,6
Iron foundry
Marble works
Coal extraction
Granite extraction
Quartz agglomerates
Slate works
Mineral extraction
Marble extraction
Ceramic, tile
Steel foundry
Slate extraction
Cement

Conclusions

- Abnormal x-ray in 60 cases out of 2987 (2,01%)
- 22 cases of silicosis (0,74 %)
- We found several cases of advanced silicosis
- Despite the introduction of preventive measures in exposed workers, silicosis prevalence is still high. What are we missing?

Conclusions

- The fact that we still find silicosis in classical activities emphasize the need for the adoption of preventive measures and active monitoring of employees in risk activities.

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For how long?

Thank you

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Introduction

Background: Silicosis is an occupational lung disease caused by inhalation of crystalline silica dust. Despite the advances in both diagnosis and prevention the prevalence of silicosis is still high. Silicosis results in 46.000 deaths globally in 2013. In Spain, several outbreaks have been described in specific industry employees, such as quartz agglomerate workers. Despite outbreak studies(1-3), no systematic epidemiological studies have been performed up to date in Spain.
4Laboral Advanced Radiology is a company that provides on-site x-ray imaging and silicosis monitoring to spanish companies with silica-dust exposed workers

Aim: The aim of the present study is to share the findings regarding silicosis in Spanish industries with a specific occupational risk.

Methods

2987 employed workers were explored according the specific silicosis Spanish protocols(4) during 2015. Two chest radiography (posteroanterior and lateral) were taken for each individual in the place of work using a mobile x-ray unit mounted on a truck. X-ray images were evaluated by three different observers as stated by the International Labor Organization(5). We considered normal the x-ray profusions 0/- and 0/0. Profusions of 0/1 and higher were considered abnormal. Silicosis was defined by profusions values of at least 1/1.

Results

We found radiological abnormalities in 60 individuals out of 2987 explorations (2,01%; table 1). Of which 22 were newly diagnosed silicosis positive cases, a 0,74% of the total.

Table 1: Abnormal x-ray by type and specific industrial activity

Type	Category		workers	Cases	%
Extractive	Open-air		814	16	1,96
	Subterranean		192	9	4,68
		Subtotal	1006	25	2,48
Non-extractive	Foundries		500	10	2,00
	Tiles		440	7	1,59
	Marble work, quartz agglomerates and construction		473	15	3,17
	Others		376	2	0,53
	Cement and concrete		192	1	0,52
		Subtotal	1981	35	1,77
		TOTAL	2987	60	2,01

Fig.1 Percentage of abnormal X-ray by industry

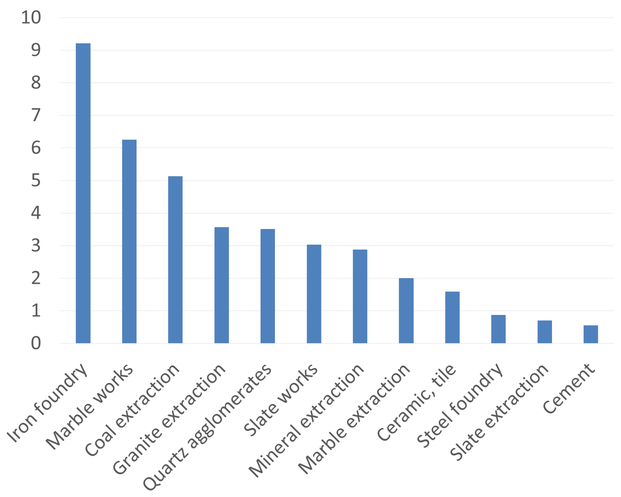

Table 2.- Abnormal cases by profusion

Category		Nº cases	Classification
Small opacities	Large opacities		
0/1		13	Abnormal non-silicotic
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The subterranean extractive industries show the highest percentage of prevalence: a 4,68% when analyzed by category (table 1). However, when analyzing by specific activity, works in: Iron foundry (9,21%), marble (6,25%), extractive subterranean (4,68%) and granite (3,57%) and quartz agglomerates (3,55%) showed the highest prevalence (figure 1)

Table 2 shows the detailed ILO profussion classification for all abnormal x-ray images with a total of 22 silicosis cases (21 small opacities and 1 large opacity). It is worth noting that we found 3 individuals with high profusiohn (3/3) and even a new cas of large type B opacity (table 2).

Conclusions

Abnormal chest images susceptible of silicosis in Spain are still high in employed workers. These results provide a novel overview of the silicosis point prevalence in Spain, and emphasize the need for the adoption of preventive measures and active monitoring of employees in risk activities.

Bibliography

1.- Martinez C, Prieto A, García L, Quero A, Gonzalez S, Casan P. Silicosis: una enfermedad con presente activo. Arch Bronconeumol. 2010; 46:97-100.
2.- Pascual S, Urrutia I, Ballaz A, Arrizubieta I, Altube L, Salinas C. Prevalence of silicosis in a marble factory after exposure to quartz conglomerates. Arch Bronconeumol. 2011;47(1):50-1
3.- Pérez-Alonso A, Córdoba-Doña JA, Millares-Lorenzo JL, Figueroa-Murillo E,García-Vadillo C, Romero-Morillos J. Outbreak of silicosis in Spanish quartz conglomerate workers. Int J Occup Environ Health. 2014;20(1):26-32
4.-Fernández Álvarez R, Martínez González C, et al. Normativa para el diagnóstico y seguimiento de la silicosis. Arch Bronconeumol.2015;51:86-93
5.-Guidelines for the Use of the ILO International Classification of Radiographs of Pneumoconioses. (Revised edition 2011). Occupational Safety and Health series No 22.International Labor Office. Geneva.