Professional Cardiovascular Diseases: analysis of INAIL data from 2008 to 2012 and possible preventive aspects

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Summary

Background: **in Italy the competence to indemnify working accidents and occupational diseases is attributed to INAIL. An accident at work is defined as a traumatic event which occurred through the intervention of a violent cause during the work, determining a worker's personal injury identified in a temporary incapacity, permanent disability or death. A professional disease is the predictable consequence of one or more agents on the place of work. While the injury is due to a violent cause concentrated in time, the professional disease is the result of a lawsuit slowly diluted over time.**
Objectives: **the purpose of this study is to evaluate the relevance of work-related cardiovascular diseases in Italy in the period 2008-2012 and possible preventive measures.**
Methods**: the present study investigated the time course of cardiovascular work-related diseases from 2008 to 2012, treated either as accidents at work or as occupational diseases, examining the data obtained from the national INAIL database. For injuries, codes were used corresponding to specific anatomical sites affected (heart, cardiovascular system, mediastinal organs and neighboring organs).**
Discussion: **little more than 50% of reported accidents involving cardiovascular system are recognized; most of them are events caused by heat, electricity, radiation, chemicals, and a relevant part of the remaining are bruises and strain injuries, and this seems to explain why workplace accidents that affect the cardiovascular system are fatal or end without permanent damage. The male gender is at greater risk, and people aged between 35 and 64 years old are more involved. With regard to occupational diseases involving the cardiovascular system, about 20% of those reported are effectively recognized, and most of them are represented, especially in agriculture, by Raynaud's Syndrome. Most of the occupational diseases involving the cardiovascular system, differently from accidents, do not have mild or fatal consequences, but produce permanent damage.**
Conclusions: **in order to prevent accidents at work it is fundamental to respect the rules of the prevention and environmental safety and the correct use of personal protective equipment, the compliance with the rules and ergonomic prescription, the compliance with the requirements of the competent physician and appropriate training and information. For the prevention of cardiovascular diseases from work it is generally useful to evaluate the level of stress (increased risk factors as a result of work - related stress disorders for cardiovascular disease); in particular, for Reynaud's syndrome it is important to avoid prolonged exposure of the hands in plastic compounds, or prolonged use of high-impact vibratory tools, avoiding precipitating factors and correct harmful habits; for varicose veins avoid a long stay standing and repeated trauma of the lower limbs.**

KEY WORDS: cardiovascular disease, INAIL data, preventive measures.

Background

In Italy the competence to indemnify working accidents and occupational diseases is attributed to INAIL.
An accident at work is defined as a traumatic event which occurred through the intervention of a violent cause during the work, determining a worker's personal injury identified in a temporary incapacity, permanent disability, (allowance for damage between 1 and 5%, with a lump sum payment for the damages of between 6 and 15%, with monthly income for damages equal to or greater than 16%) or death.
A professional disease is the predictable consequence of one or more agents on the place of work (a specific process, a specific technology, particular types of work organization - specific risk). While the

injury is due to a violent cause concentrated in time, the professional disease is the result of a lawsuit slowly diluted over time.
The study of injuries at work in Italy in recent years has shown a reduction in the overall number of harmful events and fatalities, and in an increased number of reports of occupational diseases.

Objectives

The purpose of this study is to evaluate the relevance of work-related cardiovascular diseases in Italy in the period 2008-2012, verify the nature, causes, consequences, the distribution of events by sex, age and area of work and possible preventive measures.

Methods

Accidents at work

Data from the INAIL national database (1) shows that, for the traumatic injuries involving the cardiovascular system, on a total of 2485 events reported, 1309 (52.6%) have been recognized, with a downward trend from 2008 to 2012. Regarding the nature of the injury (Figg. 1, 2), the cases are divided as reported in Table 1.

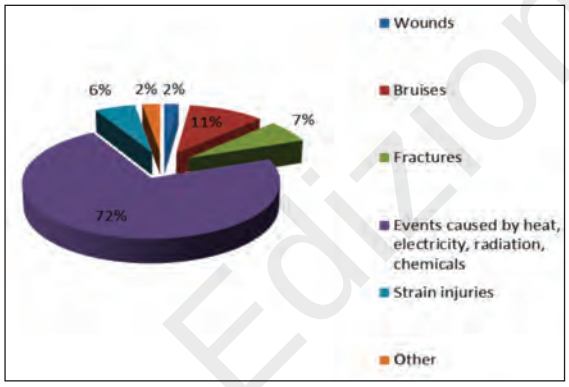

Figure 1 - Relationship between type of accidents denounced in the 2008-2012 period.

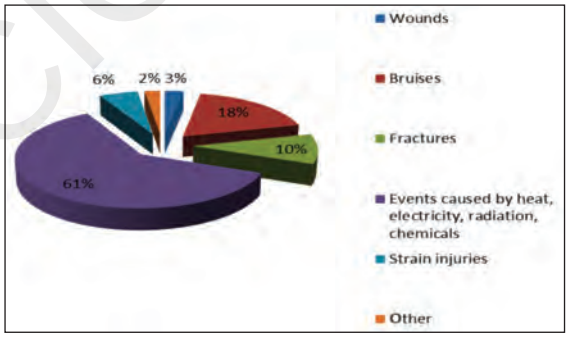

Figure 2 - Relationship between type of accidents recognized in the 2008-2012 period.

Table 1 - Nature of the injury and number of cases.

	Denounced	Recognized
Wounds	49	34
Bruises	262	231
Fractures	165	127
Events caused by heat, electricity, radiation, chemicals	1777	775
Strain injuries	139	70
Other	61	28

With regard to gender distribution, 74% of the events occurred in males and 24% in females. The distribution for age ranges is as follows:
- up to 34 years: 24%
- 35-49 years: 43%
- 50-64 years: 31%
- ≥ 65 years: 2%

The number of injuries recognized according to kind of management is:
- Agriculture: 107
- Industry: 1190
- State employees account: 12

With regard to the sectors most at risk in industry, the data shows the prevalence in percentage of accidents in transport and storage, in the manufacturing activity and in the construction sector (Fig. 3).
- Transport and storage: 21%
- Manufacturing activity: 20%
- Construction: 13%
- Health and social work: 9%
- Trade, repair vehicles: 8%

The type of services provided by INAIL (Fig. 4) has been:
- Compensation for only temporary disability: 710
- Compensation in lump-sum payment: 81
- Compensation in income: 57
- Mortals: 461

This data seems to show that most of the accidents at work, involving the cardiovascular system, have no serious consequences or, on the contrary, fatal consequences.

Occupational diseases

Data from the INAIL national database (1) shows the following situation for the occupational diseases involving the cardiovascular system according to kind of management:
- Agriculture: reported 197, recognized 42 (21.3%)
- Industry: reported in 2357, recognized 510 (21.63)%
- Employees account Status: reported 30, recognized 3 (10)%

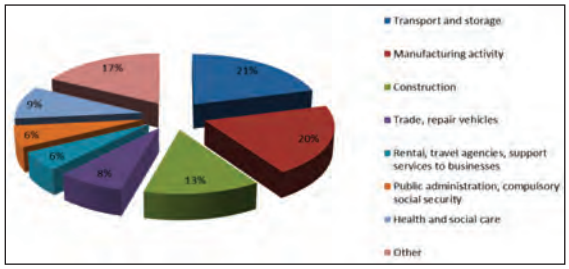

Figure 3 - Occupations in the industry with the highest incidence.

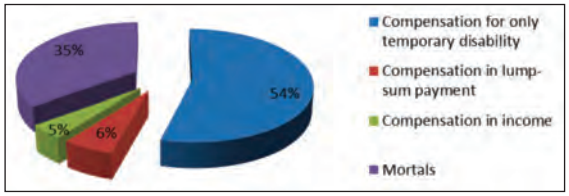

Figure 4 - Type of services provided by INAIL in the 2008-2012 period.

The nature of main professional diseases reported (total 197) in agriculture (Fig. 5) is:
- Raynaud's S.: 42%
- Varicose veins of the lower limbs: 21%
- Essential hypertension: 10%
- Complicated hypertension: 7%
- M.I.: 2%

The nature of main professional diseases recognized (total 42) in agriculture is:
- Raynaud's S.: 98%
- Varicose veins of the lower limbs: 2%

The nature of main professional diseases reported (total 2357) in industry and services (Fig. 6) is:
- Raynaud's S.: 42%
- Varicose veins of the lower limbs: 23%
- Other diseases of arteries and arterioles: 9%
- M.I.: 8%
- Complicated hypertension: 5%
- Essential hypertension: 5%
- Other ischemic heart disease: 5%
- Cardiomyopathies: 3%

Nature of main professional diseases recognized (total 510) in industry and services:
- Raynaud's S.: 87%
- Varicose veins of the lower limbs: 7%
- Other diseases of arteries and arterioles: 4%
- M.I.: 1%
- Other: 1%

With regard to gender distribution, about 82% occurred in males and about 18% in females. The percent of recognizing is about 95% males and about 5% females.
The distribution for age ranges of reported diseases (total 2584) is as follows (Fig. 7):

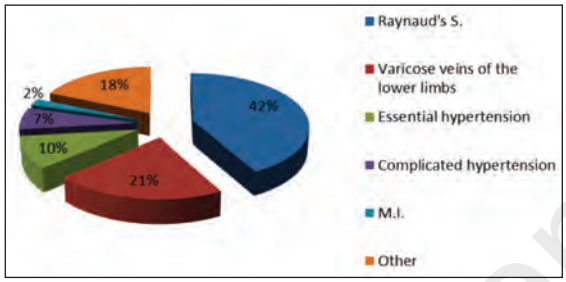

Figure 5 - Main occupational diseases reported in agriculture.

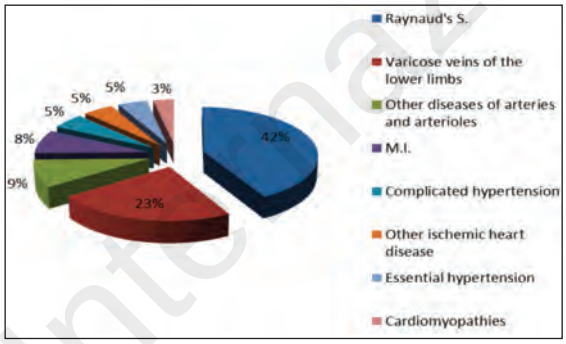

Figure 6 - Main occupational diseases reported in industry and services.

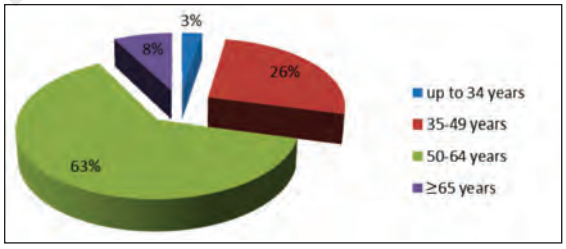

Figure 7 - Distribution for age ranges of reported diseases in industry and services.

- up to 34 years: about 3%
- 35-49 years: 26%
- 50-64 years: 63%
- ≥ 65 years: about 8%

The distribution for age ranges of recognized diseases (total 555) is as follows (Fig. 8):
- up to 34 years: about 4%
- 35-49 years: about 30%
- 50-64 years: 64%
- ≥ 65 years: about 2%

The reported professional diseases in the major employment sectors (only year 2012: total 469) (Fig. 9)
- Constructions 18%
- Manufacturing 15%
- Other service activities 8%
- Health and welfare 7%

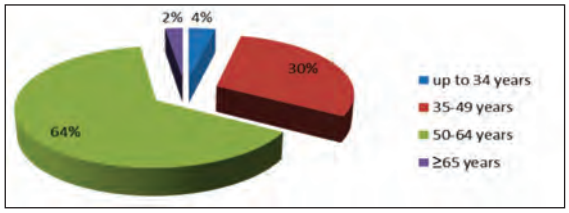

Figure 8 - Distribution for age ranges of recognized diseases in industry and services.

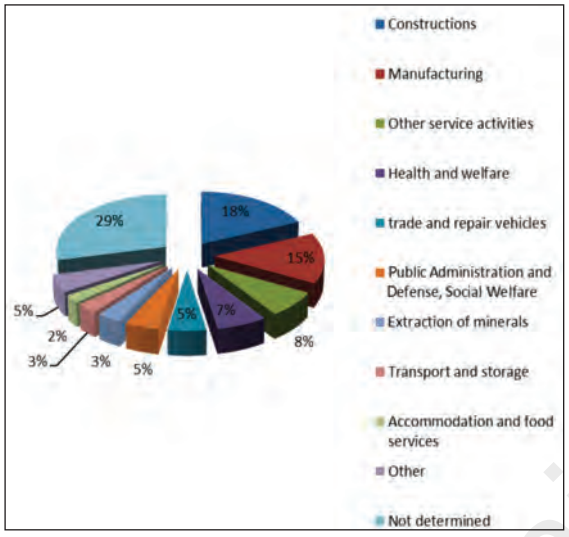

Figure 9 - Occupational diseases reported in the major employment sectors (year 2012).

The recognized professional diseases in the major employment sectors (only year 2012: total 76) (Fig. 10):
- Manufacturing 22%
- Constructions 21%
- Other service activities 8%
- Health and welfare 7%
- Extracting minerals 5%

The type of services provided by INAIL were (Fig. 11):
- Compensation for only temporary disability: 7
- Compensation in lump-sum payment: 335
- Compensation in income: 136
- Mortals: 1

This data seems to show that most of the occupational diseases involving cardiovascular system, on the contrary of accidents, do not have mild consequences or fatal consequences, but produce permanent damage.

Discussion

This data shows that a little more than 50% of reported accidents involving cardiovascular system are recognized; most of them are events caused by heat, electricity, radiation, chemicals, and a relevant part of the remaining are bruises and strain injuries, and this seems to explain why workplace accidents that affect the cardio-

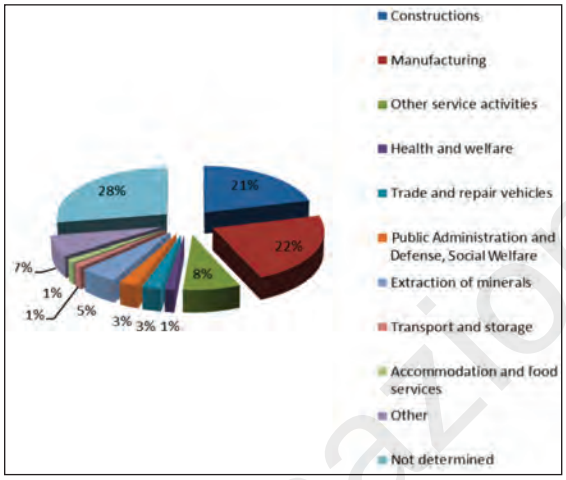

Figure 10 - Occupational diseases recognized in the major employment sectors (year 2012).

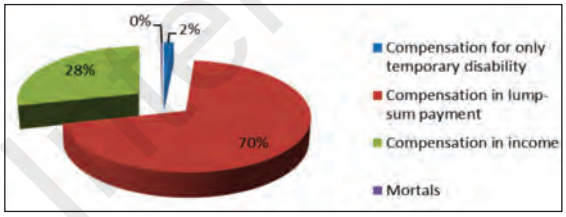

Figure 11 - Type of services provided by INAIL in the period 2008-2012.

vascular system are either fatal or end without permanent damage. The male gender is at higher risk (74%), and people aged between 35 and 64 years old are more affected (74%); most of these events happen in industry, with transport and storage, manufacturing activity and constructions being the more involved sectors.
With regard to occupational diseases involving the cardiovascular system, about 20% of events are actually recognized, and most of them consist of, especially in agriculture, Raynaud's Syndrome. The male gender is at higher risk and people aged between 35 and 64 years old are more involved; most of these diseases of affect people working in industry, especially in manufacturing activity and constructions. Most of the occupational diseases involving cardiovascular system, differently from accidents, do not have mild consequences or fatal consequences, but produce permanent damage.

Conclusions

The main target must therefore remain an "effective preventive action" as an essential element to reduce accidents and occupational diseases. Prevention must take place in a business activity that is inspired by the values of "social responsibility".
In order to prevent accidents at work (2-6), it is fundamental to respect the rules of the prevention and envi-

ronmental safety and use of equipment, the correct use of personal protective equipment, the compliance with the rules and ergonomic prescription (strain injury), the compliance with the requirements of the competent physician and appropriate training and information.

For the prevention of cardiovascular diseases at work (3,4,6-25) it is generally necessary to evaluate the level of stress (increased risk factors as a result of work - related stress disorders for cardiovascular disease); in particular, for Reynaud's syndrome it is important to avoid prolonged exposure of the hands in plastic compounds, or prolonged use of high-impact vibratory tools (hammers and tools that cause localized vibrations in the hands), avoiding precipitating factors (exposure to cold or hot) and correct harmful habits (smoke); for varicose veins (8,26-44) is important to avoid a long stay standing and repeated trauma of the lower limbs.

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