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▶ **To cite this version:**

Julie Bodin, C Ha, Audrey Petit, C Sérazin, Alexis Descatha, et al.. Effects of personal and work-related factors on the incidence of shoulder pain in a French working population. 22nd International Conference on Epidemiology in Occupational Health (EPICOH), Sep 2011, Oxford, United Kingdom. hal-02922801

HAL Id: hal-02922801
https://hal.science/hal-02922801

Submitted on 21 Sep 2020

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Effects of personal and work-related factors on the incidence of shoulder pain in a French working population

Julie Bodin[1], Catherine Ha[2], Audrey Petit Le Manac'h[1], Céline Sérazin[1], Alexis Descatha[3], Annette Leclerc[3], Marcel Goldberg[3], Ellen Imbernon[2], Yves Roquelaure[1]

[1] LUNAM ; Université d'Angers ; CHU Angers, LEEST, Angers, France
[2] Department of Occupational Health, French Institute for Public Health Surveillance, Saint-Maurice, France
[3] Inserm U1018, Villejuif, France

Objectives

Shoulder pain (SP) is common in the general population, with 1-year prevalence rates between 7 and 47%, and in the working population[1].

We used the data from a prospective surveillance program for musculoskeletal disorders implemented by the French Institute for Public Health Surveillance in the Pays de la Loire region, collected between 2002 and 2005[2] and then between 2007 and 2009.

The aim of this study was to assess the effects of personal and work-related factors on the incidence of SP.

Methods

Study population

- Working population of the Pays de la Loire region, in France
- 83 occupational physicians were trained by the investigators to randomly include workers undergoing a mandatory annual health examination
- Between 2002 and 2005, 3710 workers (58% men and mean age=38.7 ± 10.3 years) were included
- In 2007, a follow-up questionnaire was mailed to subjects (reminder letters until 2009)

Outcome

- Subjects free from SP at baseline were those :
  - without SP during the preceding 7 days and
  - without SP of more than 8 days during the preceding 12 months
- Incidents cases were defined as subjects free from SP at baseline who declared SP during the 7 days preceding the second questionnaire.

Potential risk factors

- Answers at baseline
- Variables were divided into four groups:
  - Personal factors
  - Organizational factors
  - Biomechanical factors
  - Psychosocial factors

Statistical analysis

- Analyses were performed separately for men and women to account for possible differences in exposure to work constraints between genders.
- Age was forced into the models.
- 3-stage process:
  - Stage 1: bivariate analyses, using Khi2 test, were performed between each of the potential explanatory variables and SP. Non-significant variables (p>0.20) were excluded from further analyses.
  - Stage 2: Manual backward multivariate logistic regression models were then performed for each group of variables. Non-significant variables (p>0.10) after this stage were excluded.
  - Stage 3: Final multivariate logistic regression analyses were performed using all variables remaining after stage 2, and manual backward selection retained only significant variables at a p-level of 0.05.

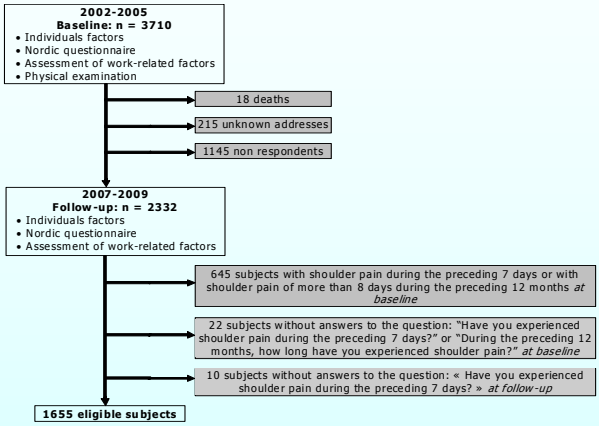
Results

233 (6.3%) subjects did never receive the questionnaire because their address was unknown (n=215) or because they were deceased (n=18). Finally, a total of 2332 subjects (67.1%, excluding subjects that could not be contacted) fulfilled the second self-administered questionnaire.

Study population

Among the 2332 subjects, 645 had reported SP during the preceding 7 days at baseline or of more than 8 days during the preceding 12 months at baseline. In addition, there was missing values for 32 subjects. Finally, 1655 subjects (946 men (57%) and 709 women (43%)) were eligible for analysis of incidence of SP (figure).

Figure: Study population flowchart



Incidence of shoulder pain

- 11.1% (n=105) for men and 20.5% (n=145) for women
- 44.2% declared right SP, 28.1% left SP and 27.7% bilateral SP
- Among active subjects, there is no difference between those who changed job or not (14.7% vs 14.8%, respectively, p=0.958).

Risk factors (Table)

- The risk of incident SP increased with age whatever the gender.
- In men, high physical demand and working with arms above the shoulder were of borderline significance.
- In women, temporary employment, high physical demand and low decision authority were associated with incident SP.

Table: Multivariate logistic models for incidence of shoulder pain

	Men (n=944 ; 105 incident SP)						Women (n=694 ; 143 incident SP)					
	N	%	OR	95% CI		p	N	%	OR	95% CI		p
Age						0.001						0.001
< 30	198	7.1	1				147	14.3	1			
30-39	292	8.2	1.2	0.6	2.4		222	17.1	1.5	0.8	2.9	
40-49	279	12.2	**2.0**	**1.0**	**3.8**		212	25.0	**2.9**	**1.6**	**5.3**	
≥ 50	175	18.9	**3.3**	**1.7**	**6.5**		113	27.4	**3.0**	**1.5**	**5.9**	
Temporary employment												0.013
No							612	19.6	1			
Yes							82	28.1	**2.1**	**1.2**	**3.8**	
Arms above the shoulder						0.073						
No	581	9.5	1									
Yes	363	13.8	1.5	1.0	2.3							
High physical demand*						0.075						<0.001
No	751	10.0	1				567	17.6	1			
Yes	193	15.5	1.6	1.0	2.5		127	33.9	**2.4**	**1.5**	**3.7**	
Low decision latitude												0.024
No							291	15.8	1			
Yes							403	24.1	**1.6**	**1.1**	**2.4**	

*RPE Borg scale ≥15 for men and ≥14 for women

Conclusion

This study showed that incident SP was related to personal and work-related factors and differed according to gender.

The effect of age was greater than that of other factors. However, age is not modifiable contrary to work-related factors.

Mechanical and psychosocial exposure should therefore be an important target for strategies for the prevention of shoulder pain in the working population.

References

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Contact: Julie Bodin (julie.bodin@univ-angers.fr)
LEEST – Unité associée InVS - Médecine E - CHU Angers
4, rue Larrey
49933 Angers Cedex, France

EPICOH – Oxford, 2011