Should prevention take an all-round view of occupational accidents triggered by movement disturbance?

Sylvie Leclercq

Working Life Department, French National Research and Safety Institute, Vandoeuvre, FRANCE

1. Introduction
The literature overlooks many occupational accidents including cases, in which the victim jams a hand in a door or window, collides with an element of the environment or finds himself/herself off-balance because a wrench slips when tightening a bolt. In common with extensively analyzed “Slips, Trips and Falls” (STFs), this type of occupational accident is triggered by a movement disturbance. Joint consideration of occupational accidents triggered by movement disturbance (OAMDs) effectively highlights accidents that are rarely targeted by research and prevention practices despite their frequency and seriousness. But, is analysis of these accidents, as a whole, truly valid from a prevention standpoint? This conference paper addresses this issue by explaining not only the advantages of grouping together all OAMDs, but also the ensuing requirement for greater understanding of worker movements.

2. A specific mechanism of injury
All accidents possess an injury mechanism acting at the end of the accident process. This mechanism involves the hazard concept, which is often characterized by an intrinsic property of an element likely to cause damage to a vulnerable person. It would appear that OAMD-related injury is directly caused by the energy of the victim’s disturbed movement combined with an element in the environment. In many cases, this element is encountered every day and it does not appear to be inherently harmful (e.g. a wall when considering the impact of an arm against a wall). Risk assessment and protection strategies are often developed based on hazard characteristics, so it would seem helpful, from a risk assessment and protection standpoint, to offer a fresh insight into accidents involving movement disturbance. This is developed by Leclercq (2015) in a chapter entitled “Hazard concept and falls” contributing to the book “Fall Prevention and Protection: Principles, Guidelines, and Practices.” to be published through Taylor & Francis Group.

3. A risk revealing root causes
While manifesting themselves through movements performed at work, OAMDs risk reveals root causes rather than clumsy or careless behavior. The accident process resulting in injury starts with a movement disturbance (a slip or a trip for example), which may or may not lead to the victim falling. Accident factors explaining this process are related for example to safety management (Bentley and Haslam, 2001), equipment usage (Kines, 2003), work organisation (Leclercq and Thouy, 2004) or work system design (Derosier et al., 2008). These factors represent as many possible levers for prevention.

4. Same Explaining factors for different movement disturbances
Distinguishing slips or trips places the focus on the triggering event (i.e. environmental factors and behavior), without necessarily taking into account the whole working context behind the event and behavior. If we consider a wider accident genesis, systemic in-depth analysis of OAMDs reveals that similar combinations of generic OAMD factors (formalized by recurring scenarios) result in different kinds of movement disturbance: a trip, a misstep and a collision, for example. Such OAMDs scenarios have been extracted from in-depth accident analysis by Leclercq et al. (2007) and Abdat et al. (2014). It therefore makes sense to consider together different types of movement disturbance if adopting a systemic approach.
5. Perspectives and conclusion

OAMDs prevention is a great issue. Prevention practices and research are not up to the risk. As far as research is concerned, it appears notably that movements understanding in occupational situations should be enhanced.

Movements performed at work and hence their injury-causing risks, are determined by working conditions combined with worker characteristics and pursued objectives. They depend on both occupational situation requirements and complex controls implemented by the operator to ensure production, while safeguarding health and safety. This is highlighted on a model developed by Vezina (2001) in the scope of work related musculoskeletal disorders. A broader insight into OAMD prevention therefore requires us to consider not only the biomechanical dimension of movement, but also its cognitive, psychological and organizational dimensions among others.

Acknowledgements

The author gratefully acknowledges X. Cuny, honorary professor in Hygiene and Safety, and the late M. Monteau, head of the safety management laboratory at France’s “Institut National de Recherche et de Sécurité”. They developed with the author the occupational accident with movement disturbance (OAMD) model, which was first presented in its English version at the International Ergonomics Association Conference held in Beijing in 2009. Without them, this paper would never have been given.

References


