



REVIEW

by
Prof. Dr. Evgenia G. Dincheva
of
Dissertation paper for conferment of academic and scientific PhD degree
Subject: „Occupational Exposure of Health Workers in the Hospital
Aid to Blood And Biological Fluids And State of the Pre- and
Post- Exposure Prevention“
Higher education field: 7. Health and sports; Professional sphere: 7.1. Medicine;
Scientific subject: Hygiene (including hygiene of labour, public services, schools, etc.);
by
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On the basis of indisputable data from literature and Eurostat statistics, the Introduction convincingly substantiates the importance of providing hygienic and safe labour conditions for health and social workers, as well as the leading primary role of the biological risk factor, and, in particular, of the most common danger – handling of blood and biological fluids and the effect of transient exposure on the transmission of dangerous transmissible infections of HIV, hepatitis B and C. Against the background of significant studies in the EU and a number of other countries, in Bulgaria there is no data on transient exposure incidence, occupational risk of infection, as well as the practice of pre- and post exposure prophylaxis. That is why, in the very beginning of this Review, I emphasize that the dissertation subject is of immediate interest and high importance.

The dissertation paper is presented for my Review in a finished form. It contains 146 pages following the generally adopted structure: introduction, literature review, aim and objectives, results, discussion, conclusions, contributions and recommendations.

Literature Review.

The literature review is written on 53 pages on the basis of 300 reference sources - 21 in the Cyrillic and 279 in the Latin alphabet. The economic effects (direct and indirect recognized expenses related to sharp force injuries (SFI) – for tests, post exposure prophylaxis, treatment, etc.), humanitarian burden (not only worry about infection, but

also the potential psychological effects of lacerations leading to distress in the injured and their relatives) are discussed.

The incidence and epidemiology of the most dangerous transmissible HIV infection causing acute and chronic hepatitis B are discussed in detail in the review on a global scale and in Europe. The large percentage of diagnosed cases is stressed upon as a hidden risk in cases of transmissible exposure. The pathogenesis, infectivity and manner of virus transmission, clinical picture of the disease, risk groups of infection carriers, as well as risk groups of recipients are examined in detail. Hepatitis C and HIV are examined with the same paradigm.

The next part of the review considers in detail the incidence of SFI as a manner of transmissible infection among individual groups of medical workers, as well as the effect of Directive 2010/32/EU implementing the Framework Agreement on prevention of sharp injuries in the hospital and healthcare sector and reduction of blood-borne infections among health workers. It is stressed that before Directive 2010/32/EU, there was regulation in Bulgaria on restriction of the risk of SFI. The Medical Directions on protection of the medical staff against infection with HIV, hepatitis B and C virus in the event of injuries (Ministry of Health Official Newsletter No. 9/2005), contain a scale for quick practical assessment of any particular exposure risk and requires presence of a system for immediate reporting, assessment, consulting and start of post exposure prophylaxis.

Upon analysis of data on Bulgaria in the literature it is found that the incidence of hepatitis B among the medical staff is twice higher as compared to the average data for the country, and the vaccination coverage varies among the individual hospitals between 0 and 100%.

The review gives due attention to the prophylactic measures, measures related to prevention of SFI, as well as to vaccination and renewed vaccination against Hepatitis B, to post-exposure vaccination, surveillance and treatment in case of doubts of transient exposure to Hepatitis B, C and HIV.

The literature review is written with logical consistency of presentation and with analytical and accurate treatment of the reference data. It is completed by a Conclusion

chapter organized in eight conclusions constituting an objective basis for shaping the aim of the dissertation paper.

Aim and Objectives.

Contingent and methods.

The aim is to assess the incidence of occupational exposure to blood and biological material among hospital health workers in the city of Sofia, to characterize the pre- and postexposure prophylaxis of the workers, their perception of the risk of infection with blood pathogens, and to evaluate the enforcement of Directive 2010/32/EU in practice.

Eight objectives are formulated for the accomplishment of this aim. In my opinion, the first objective concerning translation and adaptation of a poll form should be assigned to the Methods Section. Implementation of the remaining seven objectives completely secures implementation of the set target.

In essence, the research is transversally retrospective, carried out with an impressive contingent of 2744 health workers from 19 hospitals in Sofia - 763 physicians, 1427 nurses, 208 laboratory technicians, 176 midwives, 77 rehabilitators, 93 ward attendants have been examined. The mean length of service of the persons examined is $24,8 \pm 12,6$ years.

A standardized questionnaire-poll form for self-rating of the exposure to blood „Hospital staff exposure to blood and blood-borne infections“ widely used in the international practice has been adapted.

A four-step poll form concerning the job position and work organization has been used.

The data has been processed by means of an up-to-date statistical apparatus.

Study Results Containing Scientific, Scientific-Practical and Methodological Contributions.

The study results are presented in 27 tables and illustrated by 51 figures. The same are discussed and compared to data in the literature, mainly reliably ascertained differences and relationships. The paper contains valuable scientific information. The

following scientific results constituting scientific, scientific-practical and methodological contributions are presented in summary:

- For the first time in Bulgaria the study provides complete scientific data on the objective reality of labour incidents involving SFI among medical staff handling blood and biological media.
- The data on the high incidence of SFI – up to 63% throughout the period of service of the polled and up to 45% in the last year, considering the very low percentage of registered incidents (health workers who have always reported an incident are only 32,5%) definitely have scientific and practical contributions, namely:
 - In a great part of unreported cases, the reason given is that they have been subjectively rated as „no-risk patients“, and another large part of the injured had no idea that they should have reported, that there are procedures reducing the risk of infection, which indicates ignorance of the problem and need for more knowledge;
 - The incidents during the last year have been reported by a smaller number of health workers than those who have ever reported an incident. In most cases the incidents were reported to the chief nurse and to the chief doctor of a department. Only 2,1% informed the infection control body in the hospital, which shows ignorance of the regulation on labour incidents.
 - A number of other data, indicating differences in SFI incidence between different age groups, hospital types, various professional groups, types of manipulations performed, forms an objective basis for implementation of specific preventive measures.
- The differences in SFI incidence among the professional groups in different medical establishments and departments are an indicator used in assessment of the biological risk, for the risk groups to be defined in advance;
- Scientific contributions are contained also in the data concerning SFI incidence due, besides to causes on the part of the diseased, also to shortage of time, fatigue and disturbed caution, which is also a sign of mental fatigue. Significant

relationship of SFI to the type of changed work routine, number of night shifts per month, shift length and expended extra labour is found. That indicates the significance of labour organization and the preventive measures must be focused on that direction.

- The results of research in the application of specific protective immunity as main preventive measure against transmissible diseases among the medical staff in the event of SFI contain scientific contributions:
 - It is found that preexposure prophylaxis by inoculation against hepatitis B among the polled workers does not reach the required coverage - 42% of the workers have not been inoculated, and only 25,2% of the inoculated have three doses of vaccine administered with proof of achieved immunity;
 - Postexposure prophylaxis, too, is unsatisfactory – 51% of the employees after the most recent incident have not been offered a blood test, a preventive procedure has been offered to a small part (27%) of the health workers, in 12,8% of the cases it is inoculation against hepatitis B, while HBIG was applied to <2% ;
 - The Assessment of the range of measures for pre- and post exposure prophylaxis of the infection with blood-borne pathogens in professional groups of hospital health workers and the implementation of Directive 2010/32/EU and Ministry of Health Ordinance 3/2013, found gaps that constitute an objective basis for elaboration of specific recommendations.

The contributions of scientific and technical nature and contributions of Scientific-Practical and methodological nature formulated by Dr. Toneva coincide with the contributive worth of the obtained results and are quite acceptable.

The paper ends in eight recommendations. They are in summarized form and can serve as basic guidelines for elaboration of specific recommendations to different organization levels.

The results of the dissertation have become known to the scientific community in Bulgaria and abroad. Eight scientific articles have been published, one of them abroad. In

four of them Dr. Toneva is first author, which indicates that the dissertation paper is her personal work.

In its short form the author's summary contains all chapters of dissertation paper and fully reflects the essence of the work.

Conclusion.

I consider that the dissertation paper „Occupational Exposure To Blood And Biological Fluids And State Of The Pre- And Post- Exposure Prevention“ by Dr. Irina Dimitrova Dimitrova Toneva presented to me for review has all the qualities of a dissertation work for obtaining academic and scientific PhD degree. Higher education field: 7. Health and sports; Professional sphere: 7.1. Medicine; Scientific subject: Hygiene (including labour, public, school, etc.), and I advise the honourable members of the jury to vote positively.

Written by: 

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