

SURVEILLANCE OF ADVERSE EFFECTS OF SANITIZERS AMONG HOSPITAL WORKERS: AN EXPERIENCE REPORT

Vigilância de efeitos adversos de saneantes em trabalhadores hospitalares: um relato de experiência

Vigilancia de efectos adversos de saneantes en trabajadores hospitalarios: un relato de experiencia

Experience Report

ABSTRACT

Objective: To report the epidemiological surveillance of intoxication from sanitizers using the method of active case finding of hospital workers who experienced adverse effects. **Data Synthesis:** Experience report of university extension activities developed at the Center for Intoxication Control of the Regional University Hospital of Maringá in the period from 2010 to 2011. The activities focused on the application of the Surveillance-Education-Assistance triad. In all, 25 hospital workers who experienced adverse effects of sanitizers participated in the study. Data collection occurred through documentary research, analysis of monthly reports, and Notification Forms for Adverse Effects. After that, a semistructured interview was conducted with the subjects. Data were compared with the literature, and the results were presented in three moments: description of the active case finding process; exposure of the settings and implementation of the experience, and conclusive analysis of the experience. The main complaints of the interviewees were nasal congestion, burning eyes, sore throat and headache. All the workers reported using Personal Protective Equipment (PPE). However, eight interviewees were referred to the occupational medical service and received guidance on the use of specific PPE. Five of them confirmed following the guidelines and all remained in the same job. **Conclusion:** The epidemiological and sanitary surveillance of adverse effects of sanitizers among workers and patients of the University Hospital of Maringá has the function to identify, analyze and prevent the adverse effects of sanitizers at the hospital and investigate the notifications

Descriptors: Occupational Health; Epidemiological Surveillance; Sanitizing Products; Poisoning.

RESUMO

Objetivo: Relatar como acontece a vigilância epidemiológica da intoxicação por saneantes utilizando o método de busca ativa de trabalhadores hospitalares que sofreram efeitos adversos. **Síntese dos dados:** Relato das atividades de extensão universitária desenvolvidas no Centro de Controle de Intoxicações do Hospital Universitário Regional de Maringá (CCI/HUM), no período de 2010 a 2011, a partir da aplicação da tríade educação-vigilância-assistência. Participaram do estudo 25 trabalhadores hospitalares e todos sofreram efeitos adversos de saneantes. A coleta de dados se deu através de pesquisa documental, análise dos relatórios mensais e fichas de notificação de efeitos adversos. Em seguida, utilizou-se uma entrevista semiestruturada com os sujeitos do estudo. Os dados foram comparados com a literatura, e os resultados, apresentados em três momentos: descrição do processo de busca ativa, exposição do cenário de concepção e execução da experiência, e análise conclusiva da experiência. As principais queixas dos trabalhadores entrevistados consistiram em congestão nasal, ardência ocular, dor na garganta e cefaleia. Com relação ao uso de equipamento de proteção individual (EPI), todos os trabalhadores referiram utilizá-los, porém, oito foram encaminhados ao serviço de medicina do trabalho e receberam orientações para utilização de EPI específico. Cinco deles confirmaram adesão às orientações e todos permaneceram na mesma função. **Conclusão:** A vigilância epidemiológica e sanitária de efeitos adversos

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Received on: 10/15/2012
Reviewed on: 03/06/2013
Accepted on: 05/13/2013

de saneantes em trabalhadores e pacientes do HUM tem a função de identificar, analisar e prevenir os efeitos indesejáveis advindos do uso de saneantes no âmbito hospitalar, além de investigar as notificações.

Descritores: Saúde Ocupacional; Vigilância Epidemiológica; Saneantes; Envenenamento.

RESUMEN

Objetivo: Relatar cómo ocurre la vigilancia epidemiológica de la intoxicación por saneantes utilizando el método de búsqueda activa de trabajadores hospitalarios que sufrieron los efectos adversos. **Síntesis de datos:** Relato de las actividades de extensión universitaria desarrolladas en el Centro de Control de Intoxicaciones del Hospital Universitario Regional de Maringá (CCI/HUM) en el período de 2010 y 2011 con la aplicación de la triada educación-vigilancia-asistencia. Participaron del estudio 25 trabajadores hospitalarios que sufrieron los efectos adversos de saneantes. La recogida de datos se dio a través de una investigación documental, análisis de informes mensuales y fichas de notificación de efectos adversos. Después se utilizó una entrevista semi-estructurada con los sujetos del estudio. Los datos fueron comparados con la literatura y los resultados fueron presentados en tres momentos: descripción del proceso de búsqueda activa, exposición del escenario de concepción y ejecución de la experiencia y análisis conclusivo de la experiencia. Las principales quejas de los trabajadores entrevistados consistieron en congestión nasal, ardor ocular, dolor de garganta y cefalea. Respecto al uso de equipo de protección individual (EPI), todos los trabajadores refirieron su utilización, sin embargo, ocho de ellos fueron encaminados al servicio de medicina del trabajo y recibieron orientaciones sobre la utilización de EPI específico. Cinco de ellos confirmaron la adhesión de las orientaciones y todos permanecieron en la misma función. **Conclusión:** La vigilancia epidemiológica y sanitaria de los efectos adversos de saneantes en trabajadores y pacientes del HUM tiene la función de identificar, analizar y prevenir los efectos indesejables del uso de saneantes en el ámbito hospitalario, además de investigar las notificaciones.

Descritores: Salud Laboral; Vigilancia Epidemiológica; Saneantes; Envenenamiento.

INTRODUCTION

There is a growing preoccupation, among health professionals, with the safety of personnel working in hospital environments. Among the factors endangering their safety are chemical products with diverse etiology and toxicity, including the sanitizers, which are compulsorily used to prevent the dissemination of microorganisms in hospitals. Sanitizers are substances or preparations intended for sanitization, disinfection or disinfestation of dwelling places, public/collective environments and

for treating water. In hospitals, they are used to disinfect devices, furniture, surfaces, materials and equipment, being classified into detergents, bleaches, disinfectants, deodorizers and sterilizers⁽¹⁾.

Chemical agents used in sanitizers have caused strong environmental impact, as well as serious damage to human health. Inadequate handling of those substances may cause disorders with different levels of clinical severeness, resulting in disability, pain and discomfort for the worker, and consequently, work impairment^(1,2). The seriousness of the damages varies according to the toxicity or the concentration of certain substances in the products, to work practices and habits, to use conditions and to susceptibility of the people exposed to the sanitizers, also depending on the frequency and length of the exposure⁽³⁾.

The fast incorporation of new technologies in all fields of health surveillance and the noticeable growth of sanitizers' commercialization and use has generated the necessity of regulating and controlling their circulation. One of the ways to scale the population's exposure to sanitizers is based on the notifications of adverse events and technical complaints to the commercialization of preparations, in addition to monitoring their circulation and the use of epidemiological surveillance methods⁽⁴⁾.

The epidemiological surveillance should be understood as an ordinate and continuous collection, analysis and interpretation of data about specific events that affect the population, followed by a quick dissemination of such data, which should be analyzed by the ones responsible for the prevention and control activities. This concept is not limited to the detection of the adverse effect, but also covers the evaluation and the monitoring of clinical cases due to human exposure to toxic agents⁽³⁾.

The assistance aim of epidemiological surveillance consists in confirming the diagnostic, following the epidemiological chain, identifying the contacts, protecting the susceptible ones and blocking the transmission. The activities include data collection, processing and analysis, recommendation and promotion of appropriate control measures, evaluation of the efficacy of those measures and the propagation of pertinent information⁽³⁾.

One of the surveillance modalities regarding the use of sanitizers in hospitals after their commercialization is carried out by the *Rede de Hospitais Sentinela* (Sentinel Hospital Chain) of the *Agência Nacional de Vigilância Sanitária - ANVISA* (Brazilian National Health Surveillance Agency). The *Projeto Hospital Sentinela - PHS* (Sentinel Hospital Project) aims at enabling the participant chain to incorporate the appropriate use of technologies as a safety strategy, by means of active search of events, notification of these events and the rational use of technologies⁽⁵⁾.

The notification of adverse effects by health professionals can be carried out either in a passive/spontaneous way or in an active way, by means of occurrences search. The spontaneous notification can be carried out by any user of sanitizers; it depends, though, on the personal motivation, and, because of this, it has not reached the desired volume and confidence level to be considered as a basis for the regulation of the market by future re-evaluations of the products. On the other hand, the active search method reduces the number of subnotifications, once it is based on the periodical contact between the surveillance team and sentinel sectors or people, previously selected, who are exposed to the products^(5,6).

The *Rede Sentinela* (Sentinel Chain) was created in order to respond to the necessity of obtaining qualified information from an intra-hospital means favorable to the development of health surveillance actions in hospitals. Each hospital in the chain chooses a risk manager, responsible for articulating the hospital areas involved in infection control, pharmacovigilance, technovigilance, hemovigilance and sanitizers vigilance, aiming to identify, among such products and processes, problems that could harm the quality and safety, to broaden the knowledge of their effects and, when necessary, to modify the recommendations on their use and to promote actions to protect public health⁽⁷⁾.

Despite of the importance of implementing the risk management programs as a way to ensure the minimal safety conditions in hospital environments⁽³⁾, those programs are not common in hospitals; that is why it is vital to discuss on that subject and to spread its principles.

A study that was carried out with the aim of reporting the experience of applying an active poisoning surveillance system in hospital environments showed that, according to the tendency of most disorders, many cases are not spontaneously notified, mainly the ones with minor clinical severity. The activities follow all the requirements for a local system of epidemiological surveillance; they are developed continuously and systematically, for they collect, investigate and follow the cases for their etiological confirmation and disseminate data for the city systems⁽⁸⁾.

In this context, the present study aimed at reporting how the epidemiological surveillance happens, by analyzing cases of poisoning by sanitizers (toxicovigilance), using the active surveillance search to find hospital workers who suffered from adverse effects caused by sanitizers.

EXPERIENCE REPORT

The present study is the experience report of the activities carried out in a university extension project, in 2010 and 2011. The Project was named '*Atendimento às intoxicações profissionais no Centro de Controle de Intoxicações do*

Hospital Universitário Regional de Maringá (CCI/HUM): organização do Ambulatório de Saúde do Trabalhador' (Assistance to work-related poisoning at the Poisoning Control Center of Regional University Hospital of Maringá: organization of the Worker Health Outpatient Clinic), and it was designed from the application of the triad education-surveillance-assistance.

The Regional University Hospital of Maringá (HUM) is a public hospital and develops assistance, teaching and research activities. According to its active operational capacity, it is classified as a medium-sized institution of high complexity. It assists the population living in the Northwest Macro-regional Health Sector of Paraná State, covering an area of 115 towns.

The Poisoning Control Center (CCI) is part of the *Sistema Nacional de Informações Tóxico-Farmacológicas - SINITOX* (National System of Toxic-Pharmacological Information) and the *Rede Nacional de Informação e Assistência Toxicológica - RENACIAT* (National Chain of Toxicological Information and Assistance). This Control Center is an advisory body in the field of toxicological urgency, which provides information about toxicological exposure to health professionals and to the population in general, contributing to the poisoning epidemiological surveillance (toxicovigilance). The individuals who are poisoned are registered by means of a notification and assistance form, with a nationally standardized model⁽⁹⁾.

The participants of the Project are undergraduates of the Nursing School and Master's course students at the Nursing Post-graduation Program, both of Maringá State University (UEM).

The initial activity happened by means of active search of workers who had suffered from adverse effects caused by sanitizers. The search was carried out weekly, at pre-established times, in the outpatient units, in the hospitalization ward and in the intensive care unit of HUM.

The data collection started from a documental search, which aimed at knowing the action strategies recommended for the active case search and the analysis of monthly reports and the adverse effects notification forms, fulfilled when the cases were notified. After that, a semistructured interview was carried out with 25 workers who had suffered effects after the exposure to sanitizers and notified CCI/HUM Worker Health Outpatient Clinic during the period from January 2010 to April 2011. The interview included the following variables: types and adverse effects caused by sanitizers, use of Personal Protective Equipment (PPE) and the reference of the workers to the *Serviço Especializado em Engenharia de Segurança e Medicina do Trabalho - SESMT* (Specialized Service in Safety Engineering and Occupational Medicine), adherence of the workers to the advised treatment and their permanence in the same work

position. In order to know the surveillance of the sanitizers' adverse effects, a leading question was used: "Have you had any clinical manifestation (allergy, burn, respiratory problem, malaise ...) when you used sanitizing products during this week?"

The data was analyzed, through comparison of the literature with the practical activity, and the results were presented in three different parts: description of the active search process by means of the activities mapping; description of experience conception and execution scenarios, and conclusive analysis of the experience.

For the development of this work, the guidelines of the Resolution number 196/96 of the National Health Council were followed, with approval from the Ethics Committee for Research Involving Human Beings (*Comitê de Ética para Pesquisa Envolvendo Seres Humanos - COPEP*) of Maringá State University, granted by opinion no. 346/2008.

RESULTS AND DISCUSSION

A number of 162 visits were done to the hospital wards that assist the workers exposed to sanitizers. They generated 41 confirmations of undesired events, 18 meetings for discussion and referrals of the cases, 12 presentations in scientific events and 4 publications of educative material in PHS/HUM newsletter. The active search of those workers was carried out according to the project routine, i.e., weekly, at pre-established times, in the hospital's assistance units, hospitalization wards and intensive care unit (Figure 1).

It was noticed that the main complaints regarding the use of sanitizers were: nasal congestion, followed by nose bleeding, eyes burning, sore throat and headache. Less frequently, the workers presented difficult breathing, coughing, runny nose, dryness and damage of the hand skin.

It is noteworthy that the sanitizers, when used in an inadequate way, may cause environmental impacts and relevant damage to the health of people who are exposed to them^(1,2).

In relation to the use of PPE, all the 25 workers reported having used them. Eight workers were referred to SESMT, where they were advised to wear a breathing mask with activated carbon, boots, gloves and goggles. The recommendation of these PPE is in accordance with the international standardization of precautions for chemical agents exposure^(1,10).

Five (62.5%) of those workers reported having followed the advice received at SESMT. Three of the workers, who did not follow the instructions, reported having received only one breathing mask with activated carbon from the employer. Regarding the permanence in the same work position, the eight workers claimed not having been transferred to a different sector.

The interaction between the services related to the workers' health and safety – such as SESMT – and the employers is important for the implementation of prevention strategies and for the management of health issues at work⁽¹⁰⁾.

As for the experience conception and execution scenarios, it should be highlighted that the *Centros de Informação e Assistência Toxicológica - CIAT* (Centers of Toxicological Information and Assistance) are specialized units, with functions that vary in accordance with their insertion and resources. Among its functions, stand out the information supply and phone advising about the diagnostic, treatment prognosis and poisoning prevention; the development and participation in educational and preventive activities in toxicology and toxinology; the assistance report and provision of data (toxicovigilance); and capacitation of health professionals for the assistance in the fields of work⁽¹¹⁾.

The main assistance services developed at CCI/HUM are: information and clinical-laboratorial support to the toxicological urgencies; ambulatory and home monitoring of the cases, by means of outpatients units of child toxicology, toxicology, psychology and workers' health, in addition to the home visitation program for the ones who were poisoned; and the macro-regional toxicovigilance⁽⁹⁾.

The epidemiological and health surveillance of sanitizers' adverse effects among workers and patients of HUM has been coordinated by the Risk Management of PHS and monitored by the Intra-Hospital Sanitizers Commission since 2004. This commission aims at identifying, analyzing, and preventing all the undesirable effects caused by the use of sanitizers in hospital environments, as well as investigating the notifications.

It is composed of a multidisciplinary team that includes a pharmacist, a nurse, a doctor, an administrator and technicians. The strategies for surveillance of adverse effects are implemented in courses and events for the capacitation of workers, professors and students and in innovative measures for collection and discussion of the cases.

The procedure of spontaneous communication of adverse events with sanitizing products at HUM consists in notifying every adverse reaction, poisoning or technical complaint directly at the CCI/HUM or at the Hospital Pharmacy.

In order to intensify the notification of cases, in 2010, there was the integration of the team of the CCI/HUM Worker Health Outpatient Clinic to the Commission of Sanitizers. AST assists workers under suspicion of occupational poisoning by chemical agents. It aims at offering health assistance, epidemiological surveillance

of the notified cases and educational instructions for occupational health. It follows a phone-scheduling scheme, according to the calls made by the employing company, which involves workers' spontaneous demand.

The management of sanitizers' adverse effects surveillance, developed on the scope of the HUM worker's health, is basically structured on the identification of hazards and their causes, on the assessment of the risks that those hazards represent and on the creation and application of measures to reduce those risks, with posterior verification of the efficacy of the measures adopted⁽¹²⁾.

These activities are divided into the following steps: risk determination; risk analysis and assessment; risk control; and analysis of the data obtained, when the previous steps are assessed again. In the risk or hazards analysis, the hazards are identified, together with their causes, and the estimate of associated risks is carried out. In the risk assessment, the necessity of reducing the risks previously estimated is analyzed and, in case they are considered too high, control procedures are created and implemented⁽¹³⁾.

Considering that work conditions influence on the working process and contribute to determine the workers' healthy/unhealthy state⁽¹⁰⁾, and that the concrete way to reduce accident risks and diseases related to work is the reduction of exposure to the product, the students who carried out this study also inspected the hospital wards, in order to find problems that are beyond the individual notifications, with probabilities of collective risks.

Notifiable events are the ones which denote the product inefficacy, such as technical complaints (quality deviation), adverse reaction or poisoning (inherent in the product), with notifications of all the complaints from the workers, independently of the seriousness of the problem⁽¹⁴⁾. If any complaint is reported, it is registered on the notification form for adverse events/technical complaint of PHS. Those complaints are referred to the evaluation of the Commission of Sanitizers. After the evaluation, the suspicious cases are submitted to the epidemiological investigation procedures, carried out by the Commission's multidisciplinary team, through the analysis of the standardized form. Confirmed cases or cases considered as probable are notified to ANVISA, via Risk Management Sector (Figure 2).

In all cases of adverse effects with sanitizers in the hospital where this experience was developed, the CCI/HUM toxicological occurrence form is filled. Then, the person in charge of the worker is informed and appointments at AST and at the university Service of Safety and Occupational Medicine are scheduled. Integration and articulation of the risk management with other institutional policies happen by means of the integration among the sectors and the technicians of HUM (Poisoning Control Center, Hospital

Pharmacy, Hospital Infection Control Center, Cleaning and Laundry Service, Material and Sterilization Center) and academic sectors (Nursing Department, and Department of Pharmacy and Therapeutics) with the involvement of professors and students of Maringá State University.

Regarding the experience of the extension project, some aspects are noteworthy: the realization of integrating teaching, extension and research activities, for it is an academic project; the development of scientific communications of events on health and education fields; the participation in periodic meetings with the project team and staff of professionals and interns of CCI/HUM; the dissemination of the annual case reports in the media, playing the extension university role; the dissemination and implementation of preventive strategies to avoid poisoning in the community. Annually, the participants gather in an evaluation seminar to compile the results, analyze documents and set up the institutional report and the one to be sent to HUM Health Local Council. Besides that, the project development and the possible necessity of acquiring more information or adapting to rules and routines are discussed.

Prevention is one of the forms to avoid problems with occupational health, which may be initiated by the inadequate exposure to sanitizers. Because of this, it is necessary for the workers to know about the risks carried by chemical substances⁽¹⁰⁾. For the investigation of events and for the dissemination of results, notifications and bulletins are issued every three months.

The project also allowed the students to know sanitizers, such as paracetic acid and hydrogen peroxide (PeresalTM), indicated for critical, semi-critical and non-critical hospital articles, that have been used at HUM since 2004, substituting products with the active ingredient sodium hypochlorite.

Products with paracetic acid and hydrogen peroxide are advantageous due to the characteristics of their composition and to the excellent compatibility with different materials; they can be used to disinfect nebulizer mouthpieces, respirators, cannulas, catheters, probes and others; they can also be used in fixed surfaces and nutrition services. They do not damage plastics, PVC, silicon, latex and other materials, commonly worn down by sodium hypochlorite. They are efficient in the presence of blood, bodily fluids and fats and favor the removal of these elements from contaminated materials⁽¹⁵⁾.

The risk of these products for the people that are exposed to them is due to aspects like: toxicity of the substance itself; their concentration and form of presentation, purpose and use conditions, characteristics of the population exposed to them, exposure frequency and length⁽³⁾.

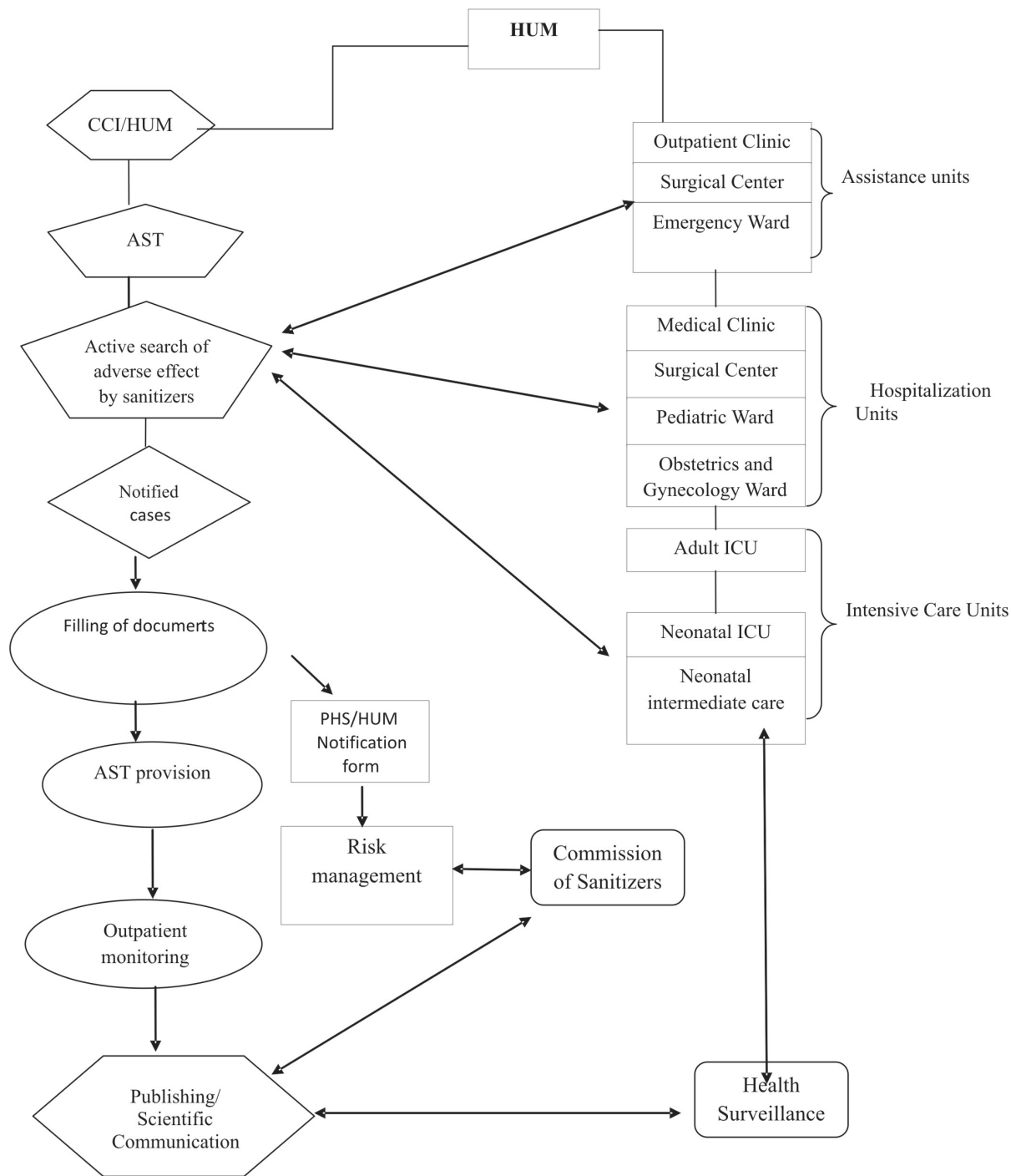


Figure 1 – Flowchart of active search for adverse effects of sanitizers. HUM, 2012.

PRODUCT DATA:

Name*:	_____	Brand:	_____
Physical form:	_____	Percentage (for alcohol):	____ Imported: <input type="checkbox"/> yes <input type="checkbox"/> no
Category (disinf, deterg.):	_____	Content (liters/grams):	_____
Application:	<input type="checkbox"/> home <input type="checkbox"/> restricted to hospitals <input type="checkbox"/> professional <input type="checkbox"/> outsourced company		
HM Registration number*:	_____ <input type="checkbox"/> does not have		
Date of manufacture:	____/____/____	Lot:	_____ Expiry Date: ____/____/____
Additional Information about the product:	_____ _____		

MANUFACTURER'S DATA:

Corporate Name*:	_____		
CNPJ:	_____ <input type="checkbox"/> does not have	Working permit (HM):	_____
Address:	_____	No:	_____
Neighborhood:	_____	City/Town:	_____ State : _____

OCCURRENCE: (DATE ____/____/____)

Technical complaint and/or accident caused by the use of the product (describe what happened)*:	_____ _____		
Quantity of people involved:	_____	Age range:	_____ Sex: _____
Burns?	<input type="checkbox"/> yes <input type="checkbox"/> no		

ONLY FOR BURNED PATIENT UNIT:

Parts of the body burned:	_____		
Body area burned:	_____ %	Burn level:	_____
Name of the Investigator:	_____		
Investigator number:	_____		

Figure 2 – Form for Epidemiological Investigation of Adverse Affect with Sanitizers. HUM, 2012.

The concrete way to reduce the risk of work-related accidents and diseases is to reduce the exposure to the products. In order to do that, the worker must handle them carefully and always wear adequate PPE.

Along all the period of this work, facilitating factors were found, such as the access allowed to participants of the project, when properly identified, to all the sectors of HUM; and the proper orientation by the Commission of Sanitizers, which presented work plans and objectives to be achieved. Notwithstanding, there are some difficulties and frustrations, such as the lack of awareness among health workers regarding the risks of using sanitizers and, because of this, the lower number of notifications of undesirable

events. It is important to discuss the weak sensitization among the HUM professionals, especially the ones who directly handle sanitizing products, such as the staffs of the Cleaning and Laundry Service, Materials and Sterilization Center and Dilution Center.

CONCLUSION

The study allowed the understanding that the sanitizers, when used inadequately, may bring risks to health, due to high toxicity of most of their compounds, leading to serious adverse effects.

The main complaints of the workers interviewed were nasal congestion, burning eyes, sore throat and headache. In relation to the use of PPE, all the workers reported having used them, however, eight of them were referred to the service of occupational medicine and were advised about the use of specific PPE. Five of them reported having followed those instructions and all of them remained in the same work position.

The employers must establish and provide preventive measures, surveillance of adverse effects, poisoning and allergies, as well as the adequate assistance. The workers exposed to sanitizers must be aware of the correct and constant use of PPE, tools that protect their health and reduce the risk of adverse effects.

With its assistance and academic results, the project has contributed to a more effective knowledge of the toxicological occurrences in the hospital unit. The academic experience, which articulates epidemiological surveillance and health surveillance in the multiprofessional, intersectorial and cooperation patterns, contribute to the formation of workers who search for safety while manipulating hazardous substances.

The epidemiological and health surveillance of sanitizers' adverse effects among HUM workers and patients aim at identifying, analyzing and preventing the undesirable effects caused by the use of sanitizers in hospital environments, besides investigating the notifications.

ACKNOWLEDGEMENTS

To the Sentinel Hospital Project, carried out at Maringá State University Hospital (HUM), and the professional team of the Poisoning Control Center (CCI).

FUNDING SOURCE

This research is part of a broader project named '*Atendimento às intoxicações profissionais no CCI/HUM: organização do Ambulatório de Saúde do Trabalhador*' (Assistance to work-related poisoning at the Poisoning Control Center of Regional University Hospital of Maringá: organization of the Worker Health Outpatient Clinic), process number 0413/96. It does not count on funding.

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