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Chemical risks that nurses are exposed in antineoplastic therapy services in a hospital setting: a systematic review protocol

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Abstract. Chemotherapy is a complex and highly specialized process that involves risk, and the success of the results largely depends on the nursing care provided to the patient. Contamination with antineoplastic chemotherapy can occur directly through the skin, membranes, mucous membranes and inhalation or indirectly through body fluids and excreta from patients who received medication within 72 hours. The effects of contamination may be immediate (dermatitis, skin hyperpigmentation and others) or late (partial alopecia, chromosomal abnormalities and increased risk of developing cancer), with risks arising from the inherent toxicity of the drug and the exposure time of individuals. antineoplastic agents. Indispensable care is required for the nursing staff in the administration of chemotherapy, in addition to the institutions providing adequate safety measures for the work of these professionals. Thus, a systematic review is proposed to obtain relevant information on these risks to plan appropriate future interventions to avoid related negative consequences. Thus, following the preferred reporting items for systematic reviews and meta-analysis protocols (PRISMA-P), this systematic review protocol was designed to provide appropriate guidelines for the development of research that can provide results to meet the goal sought. Five databases will be accessed (SCOPUS, PubMed, Science Direct, EBSCOhost, and Web of Science) and a total of 9 keyword combinations will be used. This protocol is registered in PROSPERO under the code of PROSPERO CRD42019131696
Keywords: Occupational health; Occupational exposure; Occupational risk; chemotherapy drugs; antineoplastic drugs.

Introduction

Rationale

Chemotherapy is a complex and highly specialized process that involves risk, and the success of the results largely depends on the nursing care provided to the patient. Antineoplastic chemotherapeutic agents (CA) are classified into alkylating agents, antimetabolites, antitumor antibiotics, alkaloid plants, multiple agents, hormones and hormonal antagonists (Bonassa et al, 2005). According to Andrade (2007), chemotherapy is, among the cancer treatment modalities, the one with the highest incidence of cure and the one that most increases the survival of cancer patients. It is a systemic treatment modality in which antineoplastic agents are toxic to any rapidly proliferating tissue, normal or cancerous, characterized by a high mitotic activity and short cell cycle and, consequently, the appearance of side effects (Fonseca, 2000).

Contamination by CA's can occur directly through the skin, membranes, mucous membranes and inhalation or indirectly through body fluids and excreta from patients who received medication within 72 hours. The effects of contamination may be immediate (dermatitis, skin hyperpigmentation and others) or late (partial alopecia, chromosomal abnormalities and increased risk of developing cancer), with risks arising from the inherent toxicity of the drug and the exposure time of individuals. antineoplastic agents (Clark et al, 1997).

Exposure to these agents is potentially detrimental to reproductive processes in women who are pregnant or planning to become pregnant. Complications resulting from this exposure are related to bone marrow depression (anemia, immune alteration, granulocytopenia, fertility, among others) (Almeida, 2005).

In this sense, we highlight three indispensable care for the nursing staff in the administration of chemotherapy. The first point is related to the strict attention to the information contained in the prescription. The second point is related to the rigors regarding asepsis and patient and professional protection measures and, finally, the knowledge of the drug in its dilution, conservation, stability, incompatibilities and photosensitivity aspects (Bonassa et al, 2005).

In addition, the institution's internal environment must be asked whether they are healthy or not and whether working conditions are the most desirable so that workers can perform their activities without risk or with reduced risk (Alan, 2005; Lima, 2011; Silva, 2019). Safety standards used in a chemotherapy center recommend that periodic exposure assessment be carried out; the use of personal (PPE) and collective (EPC) protective equipment; health surveillance; the existence of in-service education programs and accident reporting (INC, 2008, Maia, 2011).

Based on this information, it can be stated that, so far, no systematic review has been conducted based on the parameters listed here. Therefore, a systematic review is proposed to seek relevant information on the subject, to plan appropriate interventions in the future to avoid related negative consequences.

The aim of this systematic review is to identify the chemical occupational risks to which the nursing team has the responsibility of administering antineoplastic agents within the hospital environment is exposed.

Specifically, the proposed systematic review will try to answer the following questions sequentially: What risks do CA administrators take when manipulating these materials?

What are the standards used to prevent contamination of professionals involved in the CA administration process?

What results do you realize when these standards are used?

Methods

Research structure

This systematic review protocol follows the guidelines described in the preferred report items for systematic reviews and meta-analysis protocols (PRISMA-P) Statement (Shamseer et al. 2015, Moher et al. 2015).

Eligibility criteria

Type of studies

Initially, only articles published and peer-reviewed will be used. Experimental and theoretical studies, case studies or field studies will be found where information related to occupational risks within the hospital environment related to chemotherapeutic manipulation will be found. Articles that do not contain information relevant to the subject will be deleted.

Context

Eligible publications will include those that present investigations developed with CA administrators in the hospital environment.

Type of participants

The research will focus on personnel who actively work within the hospital environment and who have function directly related to CA administration. The study will include female and male samples, without age limits, nursing professionals. There will be no additional restriction.

Interventions

Any type of result related to chemical occupational risk within the hospital environment, related to the administration of CA within the hospital will be considered. All types of studies analyzing accidents will also be considered, reporting the type of accident and, when possible, main causes.

Configurations

Any configuration in any country, in any type of hospital are considered.

Language

The study will consider only articles written in English.

Exclusion criteria

The study will exclude documents other than peer-reviewed published articles or that is not an essential document. As well as all studies before 2016.

Information sources

The search will include the following electronic databases: SCOPUS, PubMed, Science Direct, EBSCOhost, and Web of Science. It will be conducted in articles from 2016. The year range is set for relevant non-repetitive results.

However, the study will also review the references of the articles collected to look for any additional records relevant to the review objectives. Similarly, authors with more articles on the subject and journals that appear frequently in searches will be analyzed in greater depth. This process will be repeated until no further related results can be found. In this case, publications older than the set range may be used.

Search strategy

The first stage will involve the research and screening of the literature with the use of keywords, which will be combined into phrases and will include Boolean terms (AND, OR), in addition to the inclusion

and exclusion criteria already provided for in the search.

Keyword combinations will be formed as follows:

[(“Occupational health” or “Occupational exposure” or “Occupational risk”) AND ("chemotherapy drugs" or "antineoplastic drugs" or "anticarcinogenic")]

The appropriate search engines will be used, which will display all titles. In each database, the search will be performed by entering each combination (separated by the "and" operator) and selecting, when possible, "article title, abstract, keywords". All literature eligible for inclusion based on titles will be uploaded to Endnote. This step will be faithfully reproduced for each of the selected databases.

The articles included will be selected by two independent reviewers (1R and 2R) using the criteria for eligibility and exclusion. First, both will look at titles, keywords, and summary; Secondly, introduction and conclusion will be analyzed (in addition to titles, keywords and summary again); and without third place, the full texts will be read; Then they will verify all the information found. If disagreements arise, a third reviewer (3R) must participate before a final decision is made. If data important for the review is missing or unclear, an attempt will be made to contact the corresponding study author to resolve or clarify the problem. Two independent reviewers (1R and 2R) will collect data from the selected articles. Subsequently, the retrieved information will be crossed. Any disagreement will be discussed between them and the third reviewer (3R). The following data will be extracted and recorded in duplicate by two reviewers (1R and 2R) for each study: author; year of publication; country, risks found; outcome measure (s); relevant results and conclusion (s).

In a next step, as the selected articles are analyzed, new potential keywords will be identified, and new research will be conducted. Similarly, references will also be checked to find older articles that could provide additional information. This procedure will be repeated for new articles identified until no more relevant results are obtained. In addition, other works developed by the authors of the primary studies included in the review will be consulted in order to find related investigations that meet the established inclusion criteria.

Finally, in a last stage of the research, additional sources referenced in the analyzed articles will be identified and accessed. If many articles are published in the same journal, special attention should be given to this and a more careful search should be performed.

Study records

Data management

After completing the search and recording the number of articles collected in a table, the selected articles from each database will be exported for screening and duplicate removal. The title and abstracts will be analyzed. Then, after taking into consideration the established selection criteria, the full text of the resulting studies will be retrieved and evaluated.

The number of articles resulting from each filter stage will be recorded in the in the aforementioned table. This will keep track of all studies from the first articles identified to the selected final publications, along with the number of articles excluded from each applied criterion.

Records management will be performed with "EndNote" software.

Selection process

As each combination is entered, three exclusion phases will apply:

A. Through search filters, the following criteria will be considered:
i. Date: Articles published since 2016. However, for the previously mentioned final stages of the research process, no date restrictions will apply.
ii. Document Type: Articles.
iii. Font type: journal.
iv. Language: English.
v. Title of source: related to occupational health, chemotherapy and hospital environment.
B. Repeated articles will be removed.
C. Articles will be deleted if any of the following conditions are met:
i. Studies are not applied in a hospital setting.
ii. Studies do not consider occupational risk.

Data collection process

From the selected final studies, the full text will be retrieved in order to collect information of interest. The information extracted will include:

1. general information: authors, year of publication, country.
2. Characteristics of the sample: function performed, gender distribution, risk.
3. Context: in hospital environment; associated risks.
4. Characteristics of the study: objectives, risks considered, materials and equipment capable of producing risk, conclusions.
5. Main limitations of the study.
6. Quality assessment: Possible risk of bias (risk of selection bias, accuracy, risk of information bias, risk of investigator bias), report (assessment of overall study quality), external validity (assessment of whether results of the study are generalizable), internal validity (bias evaluation due to study sample selection and / or confounding), power (evaluation of whether the study results could be obtained by chance).

Data items

Synthesis tables will be elaborated with information compiling the topics presented in the section above, mainly: reference and country, sample size, function exercised, gender distribution and

mean age group, study objectives, conclusions, risks Evaluations.

Results and priorization

The main outcome of this research is to verify what are the most common risks in the manipulation of chemical waste, more specifically chemotherapy, which means of contamination prevention and what results are found when it is prevention has been carried out.

Risk of bias in individual studies

The risk of bias will be evaluated individually for this review.

Data synthesis

The summary of the data will be performed through a narrative, based on the tables of assembled data (with information from the eligible documents). With this perspective, the bias will also be considered when analyzing the data.

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Protocol registration

This protocol is registered in the Prospective International Register of Systematic Reviews (PROSPERO) code CRD42019131696.

Authors contribution

Design and development of the study: TFBXS. HC. MR.
Title and abstract selection: TFBXS. HC. MR.
Full-text screening: TFBXS.
Data extraction: TFBXS.
Critical Rating: TFBXS.
Analysis and interpretation of the data: TFBXS.
Draft protocol: TFBXS.
Support in project development: TFBXS.

All authors have read and approved the final version.

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