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Pharmacovigilance profile in a reference center in Ecuador: A retrospective study

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Abstract

Background: The development of new health technologies – drugs has allowed to change the therapeutics of some diseases, however, despite the advantages in various clinical scenarios – prevention, prophylaxis, treatment, etc., there is evidence that adverse drug reactions (ADR) are a frequent but preventable cause of disease, disability, or death.

Therefore, it is estimated that in some countries ADRs represent between the fourth and sixth cause of mortality.

Objectives: To determine the prevalence and profile of ADRs in a reference center in Ecuador.

Design and setting: This historical cohort study included patients aged ≥ 18 years with diagnosed Adverse Reaction to Medications in the period March 2018 – March 2019, at a reference center in Ecuador. Patients were divided into three groups: I) Adverse drug reaction; ii) medication error (ME); and iii) therapeutic failure, according to WHO and ARCSA definitions.

Methods: Continuous variables were compared using t-test or Mann-Whitney test, when distributional assumptions were in doubt. Categories were compared via chi-square test or Fisher exact test, when needed. The analyses were conducted with IBM-SPSS version 25. P values < 0.05 were deemed statistically significant.

Results: Antibiotics and analgesics - antipyretics were the pharmacological groups responsible for the highest number of cases of ADRs (accounting for 9.0% and 7.6% respectively) and EM (24.7% and 20.8% respectively).

Conclusion: The ADRs, ME present an important prevalence, for this reason all health institutions have pharmacovigilance systems that allow early detection of these events within a public policy of quality and safety of care.

Keywords: Pharmacologic actions; Drug-related side effects; Adverse reactions; Epidemiology

1. Introduction

According to the World Health Organization (WHO) Pharmacovigilance is the science and activities relative to the detection, evaluation, comprehension and prevention of the adverse effects of medications or any other problems related to them [1]; in Ecuador the National Agency of Regulation, Control and Health Surveillance (ARCSA), defines it as: a public health activity aimed at the identification, quantification, evaluation, prevention of the risks associated with the medications once marketed and all the problems related to them [2].

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The ARCSA is the regulatory technical entity in charge of issuing the regulatory technical entity in charge of issuing the guidelines for the acquisition and management of medicines and supplies for human use in the country; One of the strategies to carry out this function is to provide for the creation of pharmacotherapy committees in the reference health institutions, and in turn, that pharmacovigilance technical commissions can derive from these, which will be in charge of managing everything that has to do with medicines, including biological vaccines [3], medicines that contain substances classified as subject to control and processed natural products for medicinal use, when they are under the control of health professionals, patients, or whoever uses it.

Previous studies have tried to establish the frequency of adverse events associated with medications [1,3]. this has allowed the realization of internal policies in health institutions and improve the consumption of these avoiding harmful reactions.

Knowledge of the possible causes has also led to improved handling and safety management; therefore, it is essential that each health institution can follow the recommendations established by the WHO, and local regulatory entities.

Pharmacovigilance guides the efforts of health institutions, so that all events can be processed in a timely manner; this contributes greatly to knowing the possible negative effects that a drug or a substance classified as a medicine could cause harm to human beings, this is how it prevents and allows reasoned use, therefore, it translates into a reduction in cost and an increase in efficiency in health care.

Progress in technology and the way of producing medicines to treat diseases, or different health conditions, has offered an advantage to professional prescribers and consumer patients, relieving their ailments, however, despite all this, there is more evidence that adverse drug reactions are a common cause [4].

Objective

The objective of this study was to establish the prevalence and profile of adverse drug reactions in a reference center in Ecuador.

2. Material and methods

2.1. Study design and population

This historical cohort study included patients aged ≥ 18 years with diagnosed Adverse Reaction to Medications treated in emergency and hospitalization services in the March 2018 - March 2019 period, at Hospital Vozandes Quito - a reference center in Ecuador. Patients were divided into three groups: I) ADR; ii) medication error (ME); and iii) therapeutic failure (TF).

2.1.1. Pharmacovigilance

According to the WHO and ARCSA, ADRs are defined as any response to a drug that is harmful and unintentional, and that occurs at recommended therapeutic doses in humans.

In this study, it has been distinguished based on its intensity in serious and non-serious; among the non-serious ones we have the mild and the moderate ones.

Mild

Insignificant or low intensity clinical manifestations that do not require any therapeutic measure or that do not justify discontinuation of treatment.

Moderate

Significant clinical manifestations, without immediate threat to the patient's life but requiring therapeutic measures or discontinuation of treatment.

Serious

Also known as severe, they are those that cause death, threaten the life of the patient, produce permanent or substantial disability, require hospitalization or prolong hospitalization time, produce congenital anomalies or malignant processes.

Events described as misstatements were also listed as ME and TF. The latter is defined as the ineffectiveness of the drug, contemplates the lack of pharmacological response, due to resistance, interactions, conditions of use, and quality effects.

To avoid confusion in the analysis and discussion, it was preferred to exclude the other classifications: according to the focus of the problem. [5] According to the incidence, [6] and according to the degree of knowledge of ADRs. On the other hand, preventable events that could cause harm to the patient were considered, that is, all management failures. [7] In accordance with the guidelines given by the ARCSA, Adverse Reaction to Medications notifications are notified physically in a format called Yellow Sheet, and virtual, through the platform; eReporting, in a maximum time of 5 days for mild and moderate reactions, and 48 hours for severe ones; ARCSA confirms the information and it is sent to the Uppsala drug monitoring center following the WHO international drug surveillance program.

2.2. Statistical analysis

Baseline patient characteristics were described using standard statistical methods. Continuous variables were compared using t-test or Mann-Whitney test, when distributional assumptions were in doubt. Categories were compared via chi-square test or Fisher exact test, when needed.

The analyses were conducted with IBM-SPSS version 25. P values < 0.05 were deemed statistically significant.

2.3. Ethical standards

This study follows guidelines for reporting observational studies [8] and was approved by the Institutional Research Review Commission of the Hospital Vozandes. (Protocol no. CRII-HVQ 2020-015).

Informed consent was waived because of the non-interventional and retrospective design of the study. All researchers signed a data use agreement to ensure data safety and ethical use.

3. Results

From March 1, 2018, to March 31, 2019, 52,786 patients were seen in the Emergency and Hospitalization Services of Hospital Vozandes Quito, these cares generated 204 pharmacovigilance notifications. Of those, 22 (10.7%) notifications were excluded from analysis because they had incomplete records. Therefore, the final sample consisted of 182 pharmacovigilance notifications which were divided into three groups: a) RAMs Figure 1 30.2% (n = 55), b) EM 69.2% (n = 126) y FT 0.5% (n = 1). (Figure 1). Thus, the prevalence of ADRs in our cohort was 0.10% and that of MS was 0.24%. In relation to the group that developed ADRs, the mean age was 47 ± 25 years, 19.7% were men, the vast majority of mestizo race (29.6%), 50 of them (27.4%) had some type of comorbidity. (Table 1) In the MS group, the median age was 38 ± 35 years, the vast majority were men (39.5%) of mixed race (67.5%) and with some type of comorbidity (67.0%) (Table 1).

Table 1 Demographic and clinical characteristics of the patients included in the study and stratified according to type of pharmacovigilance events

Patients characteristics	**ADR n = 55**	**ME n = 126**	**TF n = 1**
Age (years), mean ± SD	47±25	38±35	18.±0.
Male, n (%)	36 (19.7)	72(39.5)	0 (0.0)
Ethnicity, n (%)			
White	1 (0.5)	2 (1.0)	0 (0.0)
Mestiza	54 (29.6)	123(67.5)	1 (0.5)
Comorbidities, n (%)	50 (27.4)	122(67.0)	0 (0.0)

Pharmacovigilance			
Pharmacological Group, n (%)			
Analgesic - Antipyretics	14 (7.6)	38 (20.8)	0 (0.0)
Central- Analgesic	6. (3.2)	4 (2.1)	0 (0.0)
Antibiotics	18 (9.0)	45 (24.7)	1 (0.5)
Other	17 (9.3)	39 (21.4)	0 (0.0)
Rout of Administration, n (%)			
Oral	2 (1.0)	0 (0.0)	0 (0.0)
Intravenous	50(27.4)	0 (0.0)	0 (0.0)
Subcutaneus	3 (1.0)	0 (0.0)	0 (0.0)

ADR = Adverse drug reaction; ME = medication error; TF = therapeutic failure; SD = standar deviation.

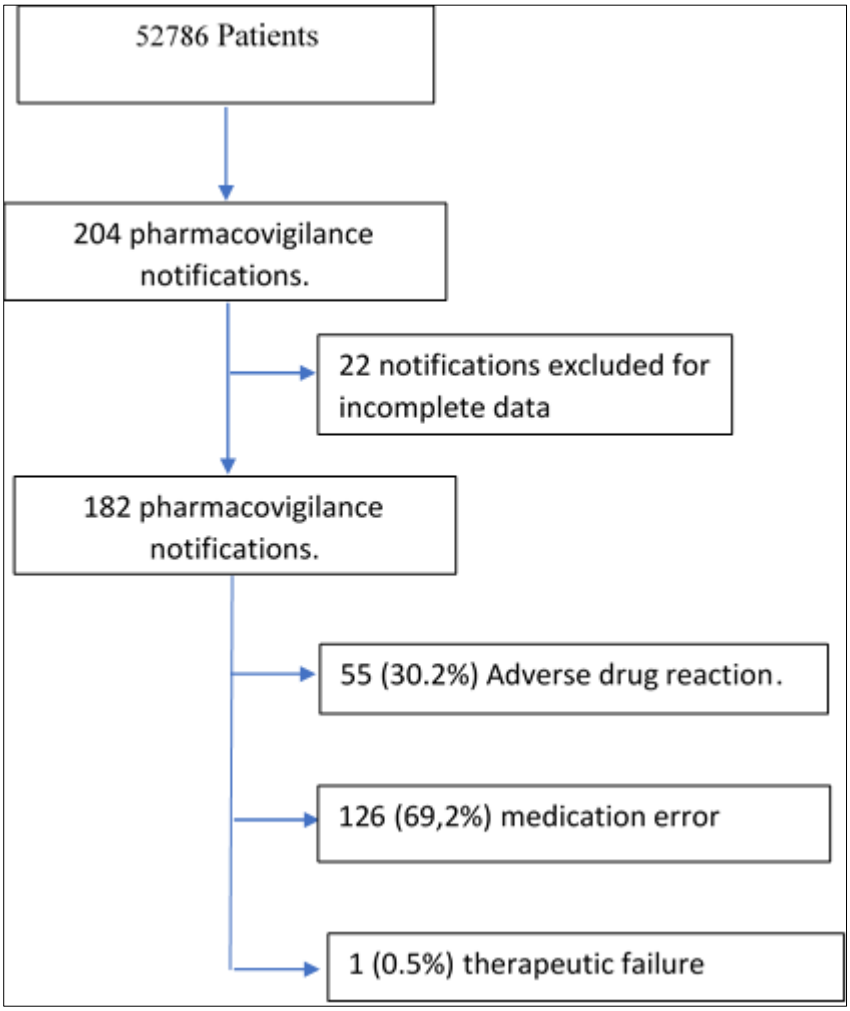

Figure 1 Flow chart of eligible patient and included for the analysis, according to type of pharmacovigilance events (March 2018 – March 2019) in of Reference Center

3.1. Pharmacovigilance

Antibiotics and analgesics - antipyretics were the pharmacological groups responsible for the highest number of cases of ADRs (accounting for 9.0% and 7.6% respectively) and EM (24.7% and 20.8% respectively). (Table 1).

4. Discussion

The development, research and innovation of medicines provides data related not only to their efficacy, but also to their safety profile; however, only its use in the general population and the conditions of routine practice allow it to be known more precisely.

The pharmacovigilance with its activities related to the detection, evaluation, understanding and prevention of ADRs – , has implications at all levels of care: hospital setting, emergency services and first level of care [9]. This is crucial in the prevention of ADRs.

In a systematic review, it was found that the hospital stay in patients with ADRs is possibly prolonged 8.8 days (range: 0.15 to 19.2 days), then expected in a hospitalization [10], increasing the cost- risk, this shows that prevention is fundamental, before, during and after the use of a medicine.

On the other hand, the international drug surveillance program of the World Health Organization reported that the prevalence of Adverse Drug Reactions in the world population varies between 0.7% to 35% [11], being similar to the prevalence of RAMS found in our cohort with a calculation of 0.10%, demonstrating that the result is integrated to what the United Nations organization proposes.

Some characteristics of ADRs, which have been detected in this analysis, are like other studies [12], and the increase in the frequency of appearance is reflected in middle adulthood [13], however, in contrast to other publications, the presence of adverse reactions and other associated events. It has been represented with the highest percentage, by the male sex.

Comorbidities are still important, and their presence is observed in almost all the notifications received. In the near future, this public health activity, and specifically the surveillance of AMRs, will have a greater influence on patients, prescribers, and political decision-makers, as well as the transnationals that produce medicines [13].

The findings in other studies show interethnic variability [14], differ from what was found in this research, and reflect the need to carry out more explorations and determine their implications. Institutional pharmacovigilance systems contribute substantially to public health by developing new management methods for drug safety, generating skills in terms of evaluation, effectiveness – risk [4], for which they constitute a fundamental axis in good pharmacovigilance practices.

It is known that ARCSA in Ecuador, as a national regulatory and control institution, registers and informs international organizations of AMR suspicions that arise in each public and private center in the country, where medicines are used.

5. Conclusion

The ADRs, ME present an important prevalence, for this reason it is mandatory that all health institutions have pharmacovigilance systems that allow early detection of these events and report them for a better quality in the care of people within a public policy of quality and safety of care.

This manuscript is probably the first research study that describes ADRs, ME and TF, their prevalence and associations, in an Ecuadorian health institution, this study will guide the conduct of new research, thanks to the implementation of a pharmacovigilance system in the institution.

Compliance with ethical standards

Acknowledgments

To the Hospital Vozandes Quito-HVQ SA, Quito, Ecuador.

Disclosure of conflict of interest

All authors have no conflicts of interest to disclose.

Statement of informed consent

Informed consent was waived due to the non-interventional design of the study and retrospective nature of data collection. All investigators signed a data use agreement to ensure the ethical and secure use of the data.

References

[1] Authority WHOL. WHO Listed Authorities Performance Evaluation Framework. 2022.

[2] ARCSA. Health regulations of the national pharmacovigilance system. 2016 p. 1–24.

[3] Goedecke T, Ord K, Newbould V, Brosch S, Arlett P. Medication Errors: New EU Good Practice Guide on Risk Minimisation and Error Prevention. Drug Saf. 2016 Jun;39(6):491-500. doi: 10.1007/s40264-016-0410-4.

[4] Ministry of Health. Secretariat of Policies, Regulation and Institutes. A.N.M.A.T. Guide to Good Pharmacovigilance Practices. 2009. Buenos Aires: A.N.M.A.T.; 2009 [cited 2013 Feb 15]. Available at: http://www.anmat.gov.ar/farmaco/GUI A_BPFV .pdf

[5] Mukattash TL, Jarab AS, Abu-Farha RK, Alefishat E, McElnay JC. Pharmaceutical Care in Children: Self-reported knowledge, attitudes and competency of final-year pharmacy students in Jordan. Sultan Qaboos Univ Med J. 2018 Nov;18(4):e468-e475. doi: 10.18295/squmj.2018.18.04.007.

[6] Ehni HJ, Wiesing U. Research ethics for a globalised world: the revised CIOMS international guidelines. Indian J Med Ethics. 2017 Jul-Sep;2(3):165-168. doi: 10.20529/IJME.2017.046.

[7] Wittich CM, Burkle CM, Lanier WL. Medication errors: an overview for clinicians. Mayo Clin Proc. 2014 Aug;89(8):1116-25. doi: 10.1016/j.mayocp.2014.05.007.

[8] von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP, et al. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. J Clin Epidemiol. 2008, 61:344-9

[9] Pérez-Ricart A, Gea-Rodríguez E, Roca-Montañana A, Gil-Máñez E, Pérez-Feliu A. Integrating pharmacovigilance into the routine of pharmacy department: experience of nine years. Farm Hosp. 2019 Ago, 43(4): 128-133. https://dx.doi.org/10.7399/fh.11169.

[10] Vallano Ferraz A, Agustí Escasany A, Pedrós Xolvi C, Arnau de Bolós JM. Systematic review of studies assessing the cost of adverse drug reactions. Systematic review of studies assessing the cost of adverse drug reactions]. Gac Sanit. 2012 May-Jun, 26(3):277-83. Spanish. doi: 10.1016/j.gaceta.2011.09.014.

[11] Becerril-Ángeles M, Aranda-Jan A, Moreno-Quiróz J. Encuesta de reacciones adversas a medicamentos en pacientes hospitalizados. Revista Alergia México. 2011, 54(4): 179-184.

[12] Osicka MRM, Gruszycki KMR, Tauguinas PAL, et al. Profile of adverse drug reactions reported in Chaco, Argentina. Rev Cubana Farm. 2014, 48(1):89-95

[13] Montané E, Santesmases J. Adverse drug reactions. Med Clin (Barc). 2020 Mar 13, 154(5):178-184. English Spanish. doi: 10.1016/j.medcli.2019.08.007.

[14] Fricke-Galindo I, Jung-Cook H, LLerena A, López-López M. Pharmacogenetics of adverse reactions to antiepileptic drugs. Neurology (Engl Ed). 2018 Apr, 33(3):165-176. doi: 10.1016/j.nrl.2015.03.005.