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Evaluation of the prescription of psychotropic drugs and their potential drug interactions at the Jamot Hospital in Yaounde-Cameroon

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Abstract

Objective: To assess the compliance of medical prescriptions containing psychotropic drugs and potential drug interactions.
Methods: This descriptive cross-sectional study was conducted at Jamot Hospital in Yaounde (Cameroon) from March to May 2018. Medical prescriptions were collected consecutively at the hospital's in-house pharmacy, and only those containing at least one psychotropic drug were retained. The date, the identity of the prescriber and the patient, as well as information about the medication were searched. Potential drug interactions were analysed using two drug interaction checking software programs: Medscape and Drugbank.
Results: One hundred and thirty-four (134) prescriptions were collected and 20 (14.92%) contained at least one psychotropic drug and all were written on simple prescriptions. The following were present: date (100%), registration number in the National Order of Doctors in Cameroon (25%), prescriber's address (30%), patient's name (95%), age (65%), sex (35%), weight (0%), dosage (85%), galenic form (90%), unit of intake (90%), frequency of intake (85%), duration of treatment (l0%), mention of "to be renewed or not" (1%). Almost 80% of the prescriptions contained at least 3 potential drug interactions, of which 72.88% were pharmacodynamic and 27.11% pharmacokinetic. The potential drug interactions identified were type C (91.52%), D (5.08%) and B (3.39%).
Conclusion: None of the prescriptions complied with the rules for prescribing psychotropic drugs and almost all the potential drug interactions identified were moderate.
Keywords: Psychotropic drugs, Potential drug interactions, Medscape, Drugbank.

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1. Introduction

Psychotropic drugs are a family of medicines indicated for the treatment of mental disorders and divided into five classes, including neuroleptics, antidepressants, normo-thymics, anxiolytics and hypnotics [1]. Some of these are poisonous substances classified under list I, such as haloperidol (Haldol®), while others are classified as narcotics, such as clorazepate (Tranxene®) [2,3]. Thus, their prescription is given on a simple or secure prescription [3], obeying precise writing rules [4,5], so as to prevent addictive or criminal use [6]. The concomitant use of psychotropic drugs with other medications can favour or potentiate the occurrence of adverse effects and/or drug interactions (DIs)

[7]. Knowing that, iatrogeny is partly prescribed by mistakes [8], the objective of the present work was, firstly, to evaluate compliance with the rules for writing prescriptions containing psychotropic drugs and secondly, to assess the iatrogenic risk via potential drug interactions (PDIs).

2. Materials and methods

2.1 Framework of the study

This descriptive cross-sectional study was conducted at the JAMOT Hospital in Yaounde (Cameroon) from March to May 2018. This is a second category health facility specializing in the management of respiratory and mental illnesses. The protocol used in this study was approved by the Regional Committee of Ethics in Human Health Research of the Centre (CE N°0518/--/CRERSHC/2018) and the Director of Jamot Hospital (N° 0000373/L/MINSANTE/SG/DHJY).

2.2 Sampling and collection of prescriptions

Medical prescriptions were collected consecutively from the hospital's in-house pharmacy on presentation of the patient, scanned for subsequent analysis, and only those that included at least one psychotropic drug were retained for the study. Information about the identity of the prescriber and the patient was kept confidential.

2.3 Assessment of the quality of the writing of prescriptions

The analysis consisted of reviewing collected prescriptions for several variables using a modified method of Sondo *et al.*[9]. Briefly, a variable present on the prescription was given a score of one (1) point and a missing variable was given a score of zero (0). The total score (TS) of a prescription was 17 points. Knowledge of writing prescription was considered poor for a value below 25% of the TS, insufficient for a value between 25 and 50% of the TS, average for a value between 50 and 75% of the TS and good for a value strictly above 75% of the TS. The variables assessed were:

- The date; (01 point)
- The identity of the prescriber: name, qualification, registration number in the Cameroon National Order of Physicians(CNOP), practice structure and telephone contact, signature; (05 points)
- The patient's identity: name, age, sex and weight; (04 points)
- Information about the medicine: its scientic name or generic name, strength, galenic form, unit of administration, frequency of administration, duration of treatment and whether or not it should be repeated. (07 points)

2.4 Analysis of potential drug interactions

The analysis of PDIs was performed using Medscape and Drugbank, an online drug interaction checking software that provides the severity of drug combinations, their summary and the course of action (see Table 1) [10].

Table 1: Potential drug interactions assessment scale

Category	Nature of the drug interaction	Explanations	
A	Unknown	No known interaction	Unknown
B	Minor	No action required	The interaction may result in limited clinical effects. These include an increase in the frequency or severity of side effects but generally do not require major changes in treatment.
C	Moderate	Monitoring treatment	The interaction may result in an exacerbation of the patient's condition and/or require a change in therapy
D	Major	Consider a change in treatment	The interaction may be life-threatening and/or require medical intervention to minimize or prevent serious adverse effects.
X	Contraindicated	Combination to avoid	Simultaneous use of contraindicated drugs

2.5 Statistical analysis

Data were entered and analyzed using Word and Excel 2016 (Microsoft Office 2016, USA). Descriptive statistics involved the presentation of data as percentages in tables and graphs and as mean ± standard error on the mean (SEM) for the variables analyzed.

3. Results

2.6 Size of prescriptions

One hundred and thirty-four (134) prescriptions had been collected and 20 (14.92%) contained at least one psychotropic drug.

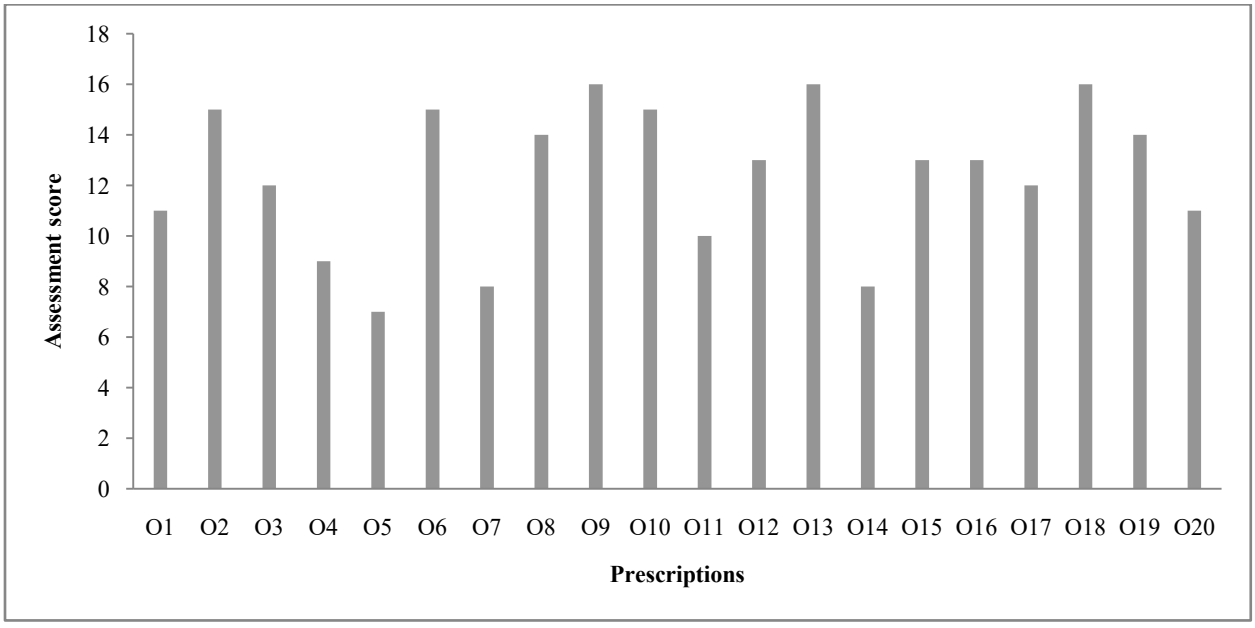
2.7 Quality assessment of prescriptions

Table 2: Variables present in the selected medical prescriptions

Variables		Value (n%)
	Date	20 (100%)
Identity of the prescriber	Name and/or first name	20 (100%)
	Qualification	20 (100%)
	Registration number in the Cameroon National Order of Doctors	5 (25%)
	Exercise structure/Telephone	6 (30%)
	Signature	20 (100%)
Patient's identity	Surname and/or first name(s)	19 (95%)
	Age	13 (65%)
	Sex (Male/Female)	7 (35%)
	Weight	0 (0%)
Information on medicines	Scientic name/ Generic name	20 (100%)
	Dosage	17 (100%)
	Galenic form	18 (90%)
	Socket unit	18 (90%)
	Frequency of use	17 (85%)
	Length of time taken	2 (10%)
	Mention to be "renewed or not".	1 (5%)

All medical prescriptions included in this study were written on simple prescriptions. Several variables were missing except for the date, which was present in all prescriptions.

Figure 1: Prescription writing assessment score



Fifteen percent of prescribers had insufficient knowledge of prescription writing, 30% had average knowledge and 60% had good knowledge. The average score for knowledge of prescription writing was 12.40 ± 2.85.

2.8 Distribution of the different classes of psychotropic drugs

Table 3: Census of drug prescriptions

Therapeutic class	Generic name	ATC Code	Value (n%)
Neuroleptic	Haloperidol	N05AD01	9 (13.85%)
	Risperidone	N05AX08	6 (9.23%)
	Levomepromazine	N05AA02	1 (1.54%)
	Fluphenazine	N05AB02	6 (9.23%)
	Chlorpromazine	N05AA01	3 (4.62%)
Anxiolytic	Bromazepam	N05BA08	1 (1.54%)
	Mezazolam	N05BA25	8 (12.31%)
	Diazepam	N05BA01	1 (1.54%)
Anticholinergic	Trihexyphenidyl	N04AA01	14 (21.54%)
	Biperidene	N04AA02	1 (1.54%)
Antihistamine	Alimemazine	R06AD01	3 (4.62%)
Antiepileptic	Carbamazepine	N03AF01	4 (6.15%)
	Sodium valproate	N03AG01	2 (3.08%)
	Clonazepam	N03AE01	3 (4.62%)
Beta-blocker	Propranolol	C07AA05	3 (4.62%)

ATC: Anatomical Therapeutic Chemical

Two classes of psychotropic drugs were available: neuroleptics were most represented by haloperidol and anxiolytics by mexazolam. Clonazepam was the only generic name related to narcotics, and trihexyphenidyl was the most prescribed molecule.

2.9 Number of medicines prescribed per prescription

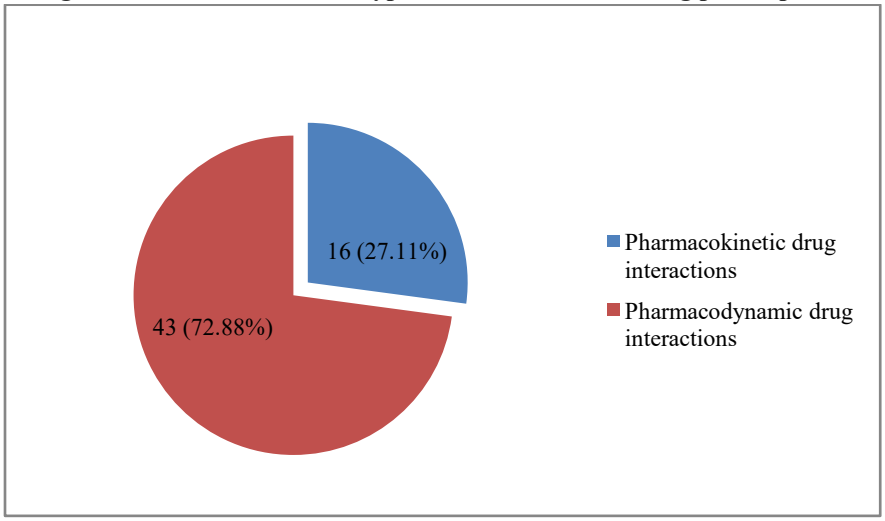
Table 4: Distribution of medicines by prescription

Number of medicines prescribed	Value (n%)
1	1 (5%)
2	6 (30%)
3	4 (20%)
4	7 (35%)
5	2 (10%)

The maximum number of drugs found in a prescription was five (5), however the majority of prescriptions contained four (4). The average number of drugs per prescription was 4.2 ± 1.4.

2.10 Types of potential drug interactions

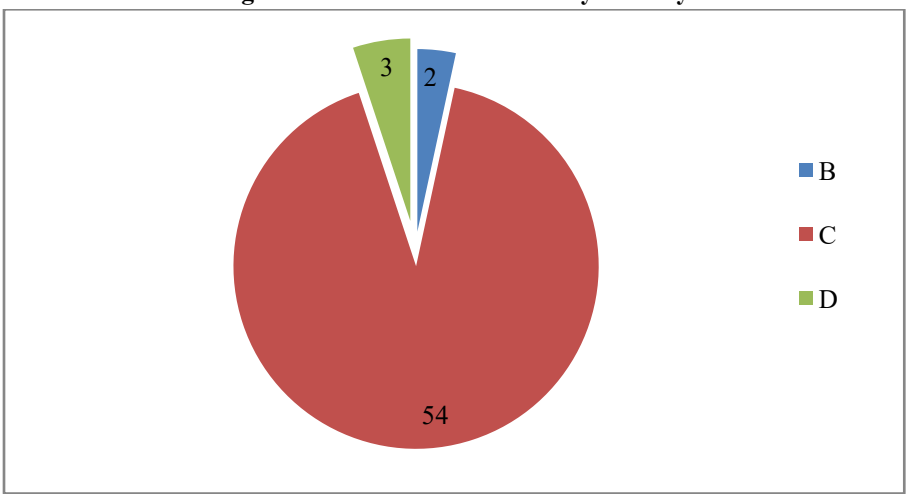
Figure 2: Distribution of the type of PMI observed among prescriptions



Of all the potential drug interaction (PDI) identified, almost half were pharmacodynamic.

2.11 The severity of potential drug interactions

Figure 3: Distribution of PDIs by severity



The majority of the recorded PDIs belonged to category C (91.52%), followed by category D (5.08%) and category B (3.39%).

2.12 Distribution of potential drug interaction combinations

Table 5: Potential drug interactions

Combination of drugs		Value (n%)
Risperidone	Trihexyphenidyl	7 (11.86%)
Haloperidol	Trihexyphenidyl	5 (8.47%)
Trihexyphenidyl	Fluphenazine	5 (8.47%)
Alimemazine	Trihexyphenidyl	4 (6.78%)
Chlorpromazine	Haloperidol	4 (6.78%)
Alimemazine	Risperidone	3 (5.08%)
Clonazepam	Risperidone	3 (5.08%)
Trihexyphenidyl	Chlorpromazine	3 (5.08%)
Carbamazepine	Trihexyphenidyl	2 (3.39%)
Fluphenazine	Clonazepam	2 (3.39%)
Fluphenazine	Risperidone	2 (3.39%)
Haloperidol	Fluphenazine	2 (3.39%)
Trihexyphenidyl	Clonazepam	2 (3.39%)
Alimemazine	Clonazepam	1 (1.69%)
Alimemazine	Haloperidol	1 (1.69%)
Chlorpromazine	Carbamazepine	1 (1.69%)
Chlorpromazine	Diazepam	1 (1.69%)
Chlorpromazine	Carbamazepine	1 (1.69%)
Fluphenazine	Biperidene	1 (1.69%)
Haloperidol	Carbamazepine	1 (1.69%)
Haloperidol	Levomepromazine	1 (1.69%)

Trihexyphenidyl and haloperidol were the two drugs found in the majority of cases of PDI.

4. Discussion

Twenty prescriptions were selected and none of them were compliant. By definition, a prescription is considered compliant when it contains all the required information, and non-compliant if at least one information is missing [11]. The absence of one of these pieces of information could have many consequences, especially in the case of psychotropic drugs [8]. Clonazepam was found to be prescribed in three (3) simple prescriptions. These should be written on a prescription that is secured in relation to the risks involved [3]. The date is the element in the prescription that provides information about the validity of prescription [12]. It was present on all prescriptions in the present work, in contrast to the results of Ginenus *et al*[13]. As for

information on the identity of the prescriber, 75% of them did not mention their CNOP registration number and 60% their practice structure as well as their telephone contact.

The work of Sondo *et al* [9] and Ahmed [14] showed that prescribers had filled in this field completely. One of the *sine qua non* conditions for practising as a doctor in Cameroon is registration with the CNOP [15]. Non-conformities relating to the identity of the patient were noted, and were in line with the work of Sondo *et al* [9] and Ahmed [14]. This information helps to avoid errors, particularly at the time of dispensing and/or during the administration of a drug [8]. Apart from the speciality name or the international non-proprietary name, the other elements of the dosage were not all filled in, in line with the work of Ginenus *et al* [13]. These shortcomings are a limitation with regard to the doses to be dispensed and administered to the patient [8]. *Finally,* the prescribers' knowledge of how to write a medical prescription containing psychotropic drugs was good.

A PDI is an adverse drug reaction that corresponds to pharmacological responses in which the effects of one or more drugs are altered by concurrent or prior administration of other drugs [16].

In this study, anticholinergics were the most prescribed drugs followed by neuroleptics and anxiolytics. This result is different from what was found by Ginenus *et al* [13]. The results of this study suggest a high prevalence of Parkinson's disease and/or management of extrapyramidal syndromes induced by neuroleptics such as haloperidol [17,18]. Trihexyphenydil was also found to be present in 33.88% of prescriptions where it was associated with at least one neuroleptic. Several psychotropic drugs are known to have a narrow therapeutic margin and the combination with other drugs can be harmful [19,20].

In this respect, 95% of the prescriptions contained at least two drugs and the average number of drugs prescribed was 4.2 ± 1.4. These findings were similar to those of Tognoni [21], but did not agree with the recommendations of the World Health Organisation (WHO), which recommends an average of 1.6 and 1.8 drugs per patient at the risk of falling into poly-medication [22]. Poly-medication is one of the causes of drugs interaction (DIs) occurrence and/or addition of adverse effects [20].

In this study 27.11% of PDIs were pharmacokinetic and 72.88% pharmacodynamic. The trend in results obtained by Diego Zapelini *et al* was the opposite [10]. Pharmacokinetic DIs result from absorption mechanisms, distribution, metabolism and/or excretion of the drug [23]. Pharmacodynamic DIs result from the interaction of the drug with the receptor by potentiating or reducing the effect of the drug. They are thus the most dangerous DIs [23]. In this respect, 5.08% of these DIs were major and 91.52% required treatment monitoring. These results were contrary to those of Diego Zapelini *et al.* [10] and may be explained by the different drug classes used.

Medical prescriptions do not comply with the rules for prescribing psychotropic drugs and there is a potential iatrogenic risk of prescriptions.

4.1 Strength of the study

The present work has identified the potential risks in a medical prescription containing at least one (1) psychotropic drug.

4.2 Limitations of the study

The study did not take into account the opinion of prescribers in order to find out more about the reasons for the non-compliance found in the medical prescriptions. As for PDIs, the analysis using an online software does not take into account the dosage and/or duration of treatment, which may bias the judgement.

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