Prescription and Consumption of Solid Oral Drugs Dispensed as Unitary Doses in a Third Level Hospital

David Calderón-Guzmán¹, Ernestina Hernández-García², Hugo Juárez- Olguín²,³,*, Alejandro Medina-Andrade²,³, Francisca Trujillo Jimenez²

1. Laboratorio de Neuroquímica, Instituto Nacional de Pediatría (INP)
2. Laboratorio de Farmacología, INP
3. Departamento de Farmacología, Facultad de Medicina, Universidad Nacional Autónoma de México.

E mail DCG, solodavid2001@yahoo.com.mx
EHG, ernestinahg@prodigy.net.mx
HJO, juarezol@yahoo.com
AMA, alexmedina_z@hotmail.com

Short title: Prescription of Unitary Doses in Hospitals

Author for Correspondence:
Hugo Juárez Olguín
Laboratorio de Farmacología, Instituto Nacional de Pediatría.
Avenida Imán Nº 1, 3rd piso Colonia Cuicuilco CP 04530, Mexico City, MEXICO
Tel& Fax 5255 1084 3883 E-mail: juarezol@yahoo.com

Conflict of interest
All authors report no conflicts of interest relevant to this article.

Financial Support: None reported.
Abstract

Background. The knowledge about the pattern of prescription and consumption of solid oral drugs dispensed as unitary doses (UD) in Mexico is sparing.

Purpose. The aim of this study is to describe the pattern of prescription and consumption of solid oral drugs dispensed as unitary doses (UD) in a third level private hospital of Mexico.

A retrospective study of a 60-month period (from 2007 to 2011) was carried out to know the pattern of drugs dispensed as UD in a third level hospital.

Results. Among the principal drugs consumed were analgesic, antihypertensive, antibiotic, anti-inflammatory, antiepileptic, and diuretics. The dispensation of drugs per year was as follows: 181 drugs with 85167 UD in 2007; 199 with 90519 UD in 2008; 193 with 101479 UD in 2009; 195 with 100798 UD in 2010; and 198 with 103913 UD in 2011.

Conclusion: The findings confirmed that prescription and consumption of unitary doses in the hospitalization service increased, and revealed the extensive use of analgesics as the principal prescribed drug in this kind of hospital.

Key words: Drug prescriptions; Hospital pharmacy; Pharmacoepidemiology; Unitary doses.
Background

The dispensation of drugs as oral unitary doses is a scientifically designed and tested system that improves the safety of the patient and therapeutic quality in hospitals [1,2]. In each stage of the process, an independent evaluation to substantially reduce errors was carried out. The careful preparation and complete identification of unitary doses (drugs, doses, lot, pharmacological activities, expiration date, bar code, and patient’s name) in the process of drug use contributes in reducing adverse events related with accurate use of the drug [3,4].

Drugs constitute primordial base in the treatment of hospitalized patients and their incorrect use could give rise to grievous consequences on the integrity and improvement of the patients [5]. Studies on pharmacoepidemiology permit the knowledge of prescription and consumption patterns of oral unitary dose drugs and this could contribute to drug acquisition programs by medical institutions, optimum storage conditions, and avoidance of the same being out of stock [6,7]. For these reasons, the objective of this study is to describe the pattern of prescription and consumption of solid oral drugs dispensed as unitary doses (UD) in a third level private hospital in Mexico.

Results and Discussion

Table 1 shows the unitary doses orally consumed in the hospitalization service of a third level private hospital in Mexico. The total number of drugs dispensed as unitary doses was as follows: In 2007, 85167 doses from a total of 181 different drugs dispensed were consumed; in 2008, it was 90519 doses from 199 different drugs; In 2009, 101479 doses
were administered from 193 different drugs; and in 2010, 100798 doses were consumed from 195 different drugs while in 2011, it was 103913 unitary doses from 198 drugs.

Figure 1 shows drug consumptions from 2007 to 2011 based on their therapeutic activities. There were more than 50 different therapeutic groups assigned and the groups with values greater than 2% were chosen and these represent more than 77% of the total unitary doses.

The use of unitary dose drugs is increasing. Is it because more drugs are available in unitary doses or is it because the knowledge among hospital staff about medication safety has increased [8]. The use of unitary dose system is intended to optimize the consumption of drugs by the hospitalized patients as well as to help the hospitals to make efficient use of their resources [9]. This system established that the norms and procedures not only nationals but also internationals have to be followed with the objective of guaranteeing quality results in benefit of the patients and in fulfillment of therapeutic profiles.

It is important to mention that these drug presentations have variations because some of them have been discontinued by the producer laboratories or that innovative drugs for the same purpose have been introduced resulting in the use of repeated generic names but obviously different brand names and chosen by the adscript physician of the hospital.

The registry of drugs consumed in unitary doses in the hospitalization area demonstrates that a great effort and well-trained staff is required to avoid errors in dispensation and medication as well as in possible adverse effects. On knowing the enormous quantity of drugs consumed, it could be suggested that drugs belonging to the following groups: Analgesics (35.43%), Antiaggregant (2.85%), Antibiotics (6.20%), Anticonvulsants (2.66%), Antihypertensives (10.10%), anti-inflammatory (6.95%), Antiulcers (5.61%) and Gastrokinetics (7.38%), represented more than 77% of the total drugs consumed.
With respect to the consumption of analgesics, this result agrees with the studies of Sicras et al, who suggested that oral analgesics (paracetamol, tramadol, and aceclofenac) were the most consumed by hospitalized patients. However, in this study, the principal drug consumed was ketorolac.

Studies carried out by Pombo et al [10], suggest that ciprofloxacin should be considered as drug of election for integrating antibiotic consumption program in unitary doses and with the present study, it is demonstrated that with the exception of cephalexin which occupied the first place, this antibiotic was second in place in antibiotic consumption in hospitalization services.

**Conclusions**

The findings confirmed an increase in prescription and consumption of unitary doses in the hospitalization service, and revealed the extensive use of analgesics as the principal prescribed drug in this kind of hospital. The use of unitary dose drugs is increasing in Latino-American countries. Is it because more drugs are available in unitary doses or is it because the knowledge among hospital staff about medication safety has increased.

**Methods**

A retrospective study of the consumption of solid oral drugs dispensed as unitary doses (UD) in a third level private hospital in Mexico which attends patients in almost all kind of medical areas was carried out. For adequateness of prescribed drugs by medical staff, the unitary doses dispensation system of Medical Packaging Inc. with software WinPak 4.0JU was used. The data base
was built compiling information from the registers using a 60-month daily logbook prepared from January 1st, 2007 to December 31st, 2011. The information collected was organized taking into consideration therapeutic activity, the patent name of the drug, and monthly consumption of individualized drug dosification with their different brand names or pharmaceutical presentations.
Consent

The present study was classified as retrospective and epidemiologic, where the Consent and ethical approval is not strictly necessary.

Competing interest

Non-financial competing interest declared, but only limited to academic and intellectual interest.

Author contribution

DCG and HJO have made substantial contributions to conception and design of study and have been involved in drafting the manuscript, revising it critically for important intellectual content.

EHG and AMA have made substantial contributions to acquisition, analysis and interpretation of data.

Acknowledgment

We thank Dr Cyril Ndidi Nwoye a native English speaker and language professor, for the critical review and translation of this manuscript.
References


Foot notes

Figure 1: Drug consumption pattern by its therapeutic class from 2007 to 2011
Figure 1

Therapeutic Effect

- Analgesic: 35.43%
- Antiaggregant: 2.85%
- Antibiotic: 6.2%
- Anticonvulsant: 2.66%
- Antihypertensive: 10.1%
- Antiinflammatory: 6.95%
- Antiulcer: 5.61%
- Gastrokinetic: 7.38%
Additional files provided with this submission:

Additional file 1: Table 1.doc, 322K
http://www.biomedcentral.com/imedia/5580440581321984/supp1.doc