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Research Article

A STUDY OF PACKAGE INSERTS: HOW ACCURATE IS THE INFORMATION PROVIDED?

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ABSTRACT

Objectives: The objective of this study was to critically analyze the accuracy of the drug package inserts. An accurate package insert that is patient-friendly, written in a regional language, and based on guidelines can benefit patients, prescribers, and health-care providers, improving overall healthcare in our society.

Methods: The study was a cross-sectional observational type of study. One hundred and fifty package inserts were collected from the pharmacy store of a tertiary care teaching hospital in Gujarat. Package inserts with the same drug formulation and from the same company were excluded from the study. The collected package insert data were analyzed for accuracy and compliance concerning guidelines based on the "Drug and Cosmetics Act (1940) and Rules (1945)."

Results: A total of 150 drug package inserts, among them 89 were injectable, 53 were oral, and 8 were topical preparations. In therapeutic indication, posology and method of administration were present in 150 (100%) package inserts. Contra-indications, interaction with other medicaments and other forms of interaction, undesirable effects/side effects, and antidote for overdosing parameters were present, respectively, in 145 (96.66%), 133 (86.66%), 148 (98.66%), and 127 (84.66%) package inserts. In pharmaceutical information; list of excipients, shelf life in the medical product as packaged for sale, special precautions for storage, and instructions for use/handling were present, respectively, in 26 (17.33%), 81 (54%), 145 (96.66%), and 82 (54.66%).

Conclusion: We found that all package inserts included in our study were not accurate as per the Central Drugs Standard Control Organization guideline. If accurate information in the package insert is available, it can be beneficial for the patient's healthcare.

Keywords: Central drugs standard control organization guidelines, Package inserts, Pharmaceutical information, Therapeutic indications.

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INTRODUCTION

A drug package insert is a printed leaflet that is provided with the pharmaceutical product pack and approved by the administrative licensing authority and it contains information based on regulatory guidelines for the safe and effective use of a drug which is useful for the prescriber, patients, and health-care providers [1]. In the European Union which is regulated by the European medicines agency, the drug package insert is termed "patient information leaflets" [2].

Drug package insert guidelines are different in different countries. Drug package insert guidelines are governed by the "Drug and Cosmetic Act (1940) and Rules (1945)." The central drugs standard control organization (CDSCO) has established regulations for drug package inserts [3].

Due to ever growing population of our country, we face a seriously inadequate doctor-to-patient ratio. Hence, trained prescribers are not available for the whole population. Hence, there is a requirement for accurate drug package insert which includes all information based on guidelines and which can be useful for the patient for creating awareness regarding drug use. Nowadays with the increasing growth of pharmacology and pharmaceutics, well-updated drug package inserts can be useful in decreasing medication errors and adverse drug events and can be easy for prescribers. Drug package inserts are not only useful for the patients and paramedical staff but also very useful for the prescribing physician to update the knowledge. At present, in India, drug package inserts contain structure and content of the information for the prescribers only [4]. In India, drug package inserts are available in English language, but India has many languages and all people are not familiar with the English language [5]. Therefore, drug package insert should include languages that can be understood by all people of India.

In India, an electronic database of package inserts is not available, which is available in the US and Europe. In the US, drug information is available as "prescribers digital reference," it is free drug tool research to provide all information [6].

In India, drug package insert requires modification which is easy to understand, easy to read, provides all information, and is patient friendly. In this study, we will see how accurate the drug package inserts which available in India? Does the Indian Drug package insert follow the CDSCO guidelines?

The aim and objectives of this study are to critically analyze the accuracy of the drug package inserts.

METHODS

Study design

The study was cross-sectional observational type of study. A total number of 150 package inserts were included in the study which was collected from the pharmacy store of a tertiary care teaching hospital in Gujarat. Package inserts with the same drug formulation and from the same company were excluded from the study.

Ethical issues

The study was approved by the Institutional Ethics Committee for Biomedical and Health Research.

Analysis

The collected package inserts data were analyzed for accuracy and compliance with respect to guidelines based on "Drug and Cosmetics Act (1940) and Rules (1945)." The CDSCO is the National regulatory authority in India, they set the regulations for drug package inserts.

Criteria for package inserts

The package inserts were analyzed based on the following criteria:

- Section 6.2 of schedule D, included eight parameters under therapeutic indications
  1. Posology and method of administration
  2. Contra-indications
  3. Special warnings and special precautions for use, if any
  4. Interaction with other medicaments and other forms of interaction
  5. Pregnancy and lactation, if contra-indicated
  6. Effects on ability to drive and use machines, if contra-indicated
  7. Undesirable effects/side effects
  8. Antidote for overdosing.

- Section 6.3 of schedule D, which includes eight parameters under pharmaceutical information
  1. List of excipients
  2. Incompatibilities
  3. Shelf life in the medical product as packaged for sale
  4. Shelf life after dilution or reconstitution according to direction
  5. Shelf life after first opening the container
  6. Special precautions for storage
  7. Nature and specification of the container
  8. Instructions for use/handling.

Entire package inserts were checked for the presence or absence of information relevant to the above parameters. If the parameter is present in the package inserts, we mentioned "YES" and if the parameter is absent then we mentioned "NO." Then, the obtained data were analyzed and expressed in numbers and percentages.

RESULTS

A total of 150 drug package inserts were collected from the pharmacy store of S.S.G Hospital, Baroda. Among 150 package inserts included in the study, 89 were injectable, 53 were oral, and 8 were topical preparations (Fig. 1).

A total number of 150 package inserts were analyzed and results were expressed in numbers and percentages in (Tables 1 and 2).

In (Tables 1 and 2) as we mention the result of 150 drug package inserts, we noticed that therapeutic indications information is present in most of the drug package inserts but they were lacking in pharmaceutical indications information.

In our study, 150 package inserts were analyzed based on CDSCO guidelines, in therapeutic information parameter posology and method of administration which was present in 150 (100%) package inserts.

Contra-indications were present in 145 (96.66%) package inserts and Interaction with other medicaments and other forms of interaction were present in 133 (86.66%) package inserts. Pregnancy and lactation; if contra-indicated, undesirable effects/side effects and antidote for overdosing parameter present, respectively, in 135 (90%), 148 (98.66%), and 127 (84.66%) package inserts (Table 1).

Effects on ability to drive and use machines, if contra-indicated parameter is present only in 48 (32%) package inserts (Table 1).

In pharmaceutical indication parameter, list of excipients present in 26 (17.33%) package inserts. Shelf life in the medical product as packaged for sale, special precaution for storage, and instructions for use/handling are present in 81 (54%),145 (96.66%) and 82 (54.66%) package inserts, respectively. Special precaution for storage which is present in 145 (96.66%) package inserts (Table 2).

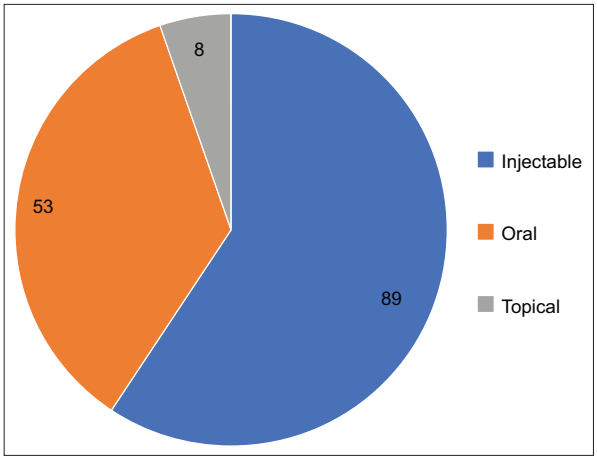

Fig. 1: Formulation-wise distribution of package inserts (n=150)

Table 1: Results of package inserts of therapeutic indication (Section 6.2)

Therapeutic indication	Present (no [%])	Absent (no [%])
Posology and method of administration	150 (100)	00 (0)
Contra-indications	145 (96.66)	05 (3.33)
Special warning and special precautions for use, if any	146 (97.33)	04 (2.66)
Interaction with other medicaments and other forms of interaction	133 (86.66)	17 (11.33)
Pregnancy and lactation, if contra-indicated	135 (90.00)	15 (10.00)
Effects on ability to drive and use machines, if contra-indicated	48 (32.00)	102 (68.00)
Undesirable effects/side effects	148 (98.66)	02 (1.33)
Antidote for overdosing	127 (84.66)	23 (15.33)

Table 2: Results of package inserts of pharmaceutical indication (Section 6.3)

Pharmaceutical information	Present (no [%])	Absent (no [%])
List of excipients	26 (17.33)	124 (82.66)
Incompatibilities	63 (42)	87 (58)
Shelf life in the medical product as packaged for sale	81 (54)	69 (46)
Shelf life after dilution or reconstitution according to direction	31 (20.66)	119 (79.33)
Shelf life after first opening the container	41 (27.33)	109 (72.66)
Special precautions for storage	145 (96.66)	05 (3.33)
Nature and specification of the container	32 (21.33)	118 (78.66)
Instructions for use/handling	82 (54.66)	68 (45.33)

DISCUSSION

In this study, package inserts of various drugs were analyzed to see if they mentioned information according to CDSCO guidelines. Still, there is an improvement in the quality and content of Indian package inserts over time, but still, certain important information is not provided according to guidelines [7].

Safe and effective use of drugs is important for maintaining the health system of the country. We need accurate and appropriate information regarding drugs. A package insert is an important source of information that is provided with prescription medication, and also approved by the regulatory authority [8]. In India, due to the low doctor-patient ratio, patients are dependent on package inserts which provide more information about the drugs. A guideline-based and accurate package insert is provided by the manufacturer, which is easy to understand and helpful for patients, prescribers, and health-care providers [9].

Based on our study, we found that therapeutic indications are mentioned in most of the package inserts as compared to pharmaceutical indications.

In our study, posology and method of administration, contra-indications, special warning, and special precautions for use are present in 150 (100%), 145 (96.66%), and 146 (97.33%), respectively, compared with another study by M. J. Sudha *et al.* [9], Priyanka *et al.* [10], Govindada*s et al.* [11], and Maheshi U. Chhaya [8], an almost similar result was found between (80 to 100%), but in M. J. Sudha *et al.* [9], study special warning and special precautions for the use are present only 57 (52%) (Table 3).

Interaction with other medicaments and other forms of interaction is present 133 (86.66%) in our study as compared to Maheshi U. Chhaya [8], study presents 89 (89%). Pregnancy and lactation if contra-indicated presented 135 (90%) in our study as compared to the Govindada*s et al.* [11] study presented 198 (75%). Undesirable effects/side effects presented 148 (98.66%) in our study as compared to Priyanka *et al.* [10] and Govindada*s et al.* [11] present 167 (86.9%) and 235 (89%), respectively. Antidotes for overdosing present 127 (84.66%) in our package inserts as compared to M. J. Sudha *et al.* [9] study reported only in 59 (54%) package inserts (Table 3).

We found that effect on ability to drive and use machines, which is present only 48 (32%) and absent 102 (68%) in package inserts, as compared to in M. J. Sudha *et al.* [9] and Govindada*s et al.* [11] study that this information presents only 13 (12%) and 49 (19%) (Table 3). This parameter is important for all sedatives and hypnotics and also other drugs acting on the central nervous system [7].

In this study, pharmaceutical information parameter included insufficient information regarding aspects such as the list of excipients, incompatibilities, the nature and specifications of the container, shelf life after dilution or reconstitution according to directions, and shelf life after the first opening of the container. The inclusion of a list of excipients is crucial due to its potential to cause allergies, making the absence of this information a factor contributing to adverse drug reactions [12].

In another study, similar to those by Priyanka *et al.* [10], Govindadas *et al.* [11], and Maheshi U. Chhaya *et al.* [8], there is a noted lack of pharmaceutical indications compared to therapeutic indications. There is a lack of pharmaceutical indications as compared to therapeutic indications (Tables 3 and 4).

In our study, the list of excipients parameter presents 26 (17.33%), but, in Priyanka *et al.* [10] and Govindada*s et al.* [11], studies present only 20 (10.4%) and 12 (12%), respectively. Shelf life in the medical product as packaged for sale is found in 81 (54%) of package inserts in our study, compared to 63 (33.8%), 73 (29%), and 16 (16%) in the studies by Priyanka *et al.* [10], Govindadas *et al.* [11], and Maheshi U. Chhaya *et al.* [8], respectively (Table 4).

Special precautions for storage present 145 (96.66%) in our study, as compared to another study by Priyanka *et al.* [10], Govindada*s et al.* [11], and Maheshi U. Chhaya [8]; this parameter is present between (75 and 95%). Instruction for use/handling is present in our study 82 (54.66%) but, in Priyanka *et al.* [10], Govindada*s et al.* [11] study, it is present between (25 and 30%) (Table 4).

Based on our study of 150 drug package inserts, we found that in therapeutic indication parameter, posology and method of administration present in 150 (100%) package inserts which are maximum in number, but effects on the ability to drive and use

Table 3: Comparison with other studies (Section 6.2 therapeutic indications)

Therapeutic indication	Current study (n=150) (%)	Maheshi U. Chhaya [8] (n=100) (%)	M. J. Sudha *et al.* [9] (n=110) (%)	Priyanka *et al.* [10] (n=192) (%)	Govindas *et al.* [11] (n=263) (%)
Posology and method of administration	150 (100)	98 (98)	110 (100)	187 (97.3)	249 (95)
Contra-indications	145 (96.66)	96 (96)	99 (90)	179 (93.2)	245 (93)
Special warning and special precautions for use, if any	146 (97.33)	89 (89)	57 (52)	175 (91.12)	233 (85)
Interaction with other medicaments and other forms of interaction	133 (86.66)	89 (89)	90 (82)	149 (77.6)	201 (76)
Pregnancy and lactation, if contra-indicated	135 (90.00)	89 (89)	84 (76)	148 (77)	198 (75)
Effects on ability to drive and use machines, if contra-indicated	48 (32.00)	16 (16)	13 (12)	36 (18.7)	49 (19)
Undesirable effects/side effects	148 (98.66)	97 (97)	NR	167 (86.9)	235 (89)
Antidote for overdosing	127 (84.66)	84 (84)	59 (54)	100 (52)	103 (39)

NR: Not reported, values are in (no [%]), (n=Total number of drug package inserts included in the study)

Table 4: Comparison with other studies (Section 6.3 pharmaceutical information)

Pharmaceutical information	Current study (n=150) (%)	Maheshi U. Chhaya [8] (n=100) (%)	Priyanka *et al.* [10] (n=192) (%)	Govindadas *et al.* [11] (n=263) (%)
List of excipients	26 (17.33)	12 (12)	20 (10.4)	91 (35)
Incompatibilities	63 (42)	19 (19)	50 (26)	73 (28)
Shelf life in the medical product as packaged for sale	81 (54)	16 (16)	65 (33.8)	75 (29)
Shelf life after dilution or reconstitution according to direction	31 (20.66)	NR	06 (3.1)	33 (13)
Shelf life after first opening the container	41 (27.33)	NR	09 (4.6)	26 (10)
Special precautions for storage	145 (96.66)	95 (95)	148 (77)	227 (86)
Nature and specification of the container	32 (21.33)	92 (92)	21 (10.9)	238 (90)
Instructions for use/handling	82 (54.66)	NR	48 (25)	76 (29)

NR: Not reported, values are in (no [%]), (n=Total number of drug package inserts included in the study)

machines, if contra-indicated parameter is present in 48 (32%) package inserts which are minimum in number. In the pharmaceutical information parameter, special precaution for storage is present in 145 (96.66%) package inserts which are the maximum number but a list of excipients is present in 26 (17.33%) package inserts which are the minimum number.

Limitations

The limitations of this study could be that if we were able to compare the drug package inserts from the other government hospitals, we could know if the other government hospital package insert is accurate or not.

CONCLUSION

We found that all package inserts included in our study are not accurate as per the CDSCO guidelines. A drug package insert is an important source of drug-related information. If the package insert is available based on guidelines, easy to understand, more patient-friendly, and also in a regional language, it could be useful for the patients, prescribers, and health care providers and also be beneficial for better health care in our society. If updated package inserts are available, it is also useful for physicians to know more about drug-related information. Indian regulatory authority should take strict action to improve and better drug package inserts for better health care in our country.

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AUTHOR'S CONTRIBUTION

Dr. Krishna Patel: Research investigator, data collection, data and statical analysis, and manuscript preparation. (Please, if possible kindly make the separate sentence from "Dr. Prashant Shah: Research investigator, manuscript review and editing, and supervision."

Dr. Pratit Vyas: Research investigator, concept, manuscript review and editing, and supervision.

CONFLICTS OF INTEREST

There were no conflicts of interest in the study.

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