

Original Research Article

DOI: <https://dx.doi.org/10.18203/2394-6040.ijcmph20210241>

Common drugs causing allergy in patients attending a tertiary care centre in South Kerala

Shameem N.¹, Krishna Kumar M. K.^{2*}

¹Department of Respiratory Medicine, SUT Academy of Medical Sciences, Venkode, Thiruvananthapuram, Kerala, India

²Department of Community Medicine, Sree Narayana Institute of Medical Sciences, Chalakka, Ernakulam, Kerala, India

Received: 01 December 2020

Revised: 14 January 2021

Accepted: 15 January 2021

***Correspondence:**

Dr. Krishna Kumar M. K.,

E-mail: mkkumar3@yahoo.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Drugs play an important part in the wellbeing of human life. Adverse drug reactions are also a part of drug administration. Adverse drug reactions mainly manifest in the form of skin lesions such as urticaria or maculopapular rash. Drug allergy is a common clinical problem and its assessment is important for appropriate management of the condition. Diagnosis of drug allergy relies on a careful history and in some instance's allergy testing may be required. Aim was to determine the common drugs causing allergy.

Methods: After obtaining informed written consent, data was entered in a schedule and an intradermal test was done in the volar aspect of the patient's forearm with the selected list of twenty-four drugs.

Results: The maximum number of study subjects showed positive reactions were for ampicillin, paracetamol, diclofenac and ketorolac.

Conclusions: The drugs which are commonly used by the medical practitioners were found to be more allergic to the study subjects.

Keywords: Drug, Adverse drug reaction, Allergy, Intradermal test

INTRODUCTION

As per WHO, Adverse drug reaction is 'any noxious change which is suspected to be due to a drug, occurs at doses normally used in man, requires treatment or decrease in dose or indicates caution in the future use of the same drug'.¹ An adverse drug reaction (ADR) is an unintended reaction to a drug that occurs at doses used for prevention, diagnosis, or treatment.² ADRs are common and affects between 15 and 25% of patients; serious reactions occur in 7–13% of patients.^{3,4} Drug allergy affects the quality of life of the patient, lead to delayed treatment, unnecessary investigations, increased morbidity and even death.² Furthermore, identification of drug allergy and the drug causing it is challenging. The

skin is the organ most frequently and prominently affected by drug-induced allergic reactions. The most common cutaneous manifestation is generalized maculopapular rash, which is characterized by an erythematous lesion that appear within days to three weeks after drug exposure. Drug allergic reactions can be either immediate or late reactions. Immediate reactions occur 1 to 6 hours following drug intake whereas late reaction occurs several hours to days later. Reactions can be either mild or life-threatening anaphylactic reaction.

Aim

Aim was to determine the common drugs causing allergic reactions in patients referred for drug allergy testing.

METHODS

A hospital based descriptive study with convenient sampling methodology was adopted. All patients those who attended the outpatient department of respiratory medicine of SUT academy of medical sciences from 01/02/2019 to 31/01/2020 was included in the study. It included patients referred from other departments like general medicine, general surgery, orthopaedics, gynaecology and obstetrics for drug allergy testing who had previous history of drug allergy.

Inclusion criteria

All indicated patients above the age of 10 years.

Exclusion criteria

Patients who required testing for only one or two group of drugs.

Scientific research committee and institutional ethical committee approval was obtained. After getting informed written consent each person was enrolled into the study. A detailed history of all drugs taken by the patient, including dates of administration, drug formulation, dosage and route of administration, clinical symptoms and their timing and duration in relation to drug exposure, as well as previous and subsequent drug exposures and reactions was taken

An intradermal test was done with the common drugs. Twenty-four drugs were selected for the sensitivity study. It included antibiotics, analgesics, anaesthetic agents and other common drugs. Patients were directed to stop taking antihistamines and corticosteroids 72 hours prior the test.

Table 2: Drugs tested and its reaction pattern.

S. no.		No of positive	No of negatives	No of doubtful observation
1	Ampicillin	19	77	4
2	Ceftriaxone	9	87	4
3	Ciprofloxacin	11	72	17
4	Amikacin	0	99	1
5	Metronidazole	0	100	0
6	Paracetamol	19	66	15
7	Diclofenac	20	64	16
8	Ketorolac	15	69	16
9	Tramadol	7	88	5
10	Bupivacane	1	99	0
11	Lignocaine	0	99	1
12	Pancuronium	1	92	7
13	Propofol	0	99	1
14	Succinyl Choline	7	78	15
15	Glycopyrrolate	0	100	0
16	Buprinorphine	2	96	2
17	Atropine	5	87	8
18	Midazolam	0	98	2
19	Promethazine	9	78	13

Intradermal testing

The drugs are injected into the volar aspect of the forearm with an insulin syringe and a wheal of around 3mm is made. Histamine is used as positive control and normal saline is used as negative control. Patient is observed for 20 minutes and the wheal is measured with a scale. A wheal with diameter more than double that of the negative control is considered as positive. A wheal measuring double that of negative control is considered as doubtful and less than that is considered as negative.

Data was entered into the Microsoft excel sheets. Data of the study participants, reactions by the causative drugs were extracted and summarized by absolute numbers, percentages and means.

RESULTS

The study subjects included 14 males and 86 females. The age of the study participants ranged from 18 to 84. The mean age was 46 years with a Standard deviation of 15.54. There were no patients under the paediatric age group. 25 % of patients were of age 60 years and above (Table 1).

Table 1: Demographic status of patients.

Characteristics	Frequency (%)
Male	14 (14)
Female	86 (86)
Paediatric age group	0
Adults	75 (75)
Geriatric age group	25 (25)

Continued.

S. no.		No of positive	No of negatives	No of doubtful observation
20	Deriphiline	0	100	0
21	Metaclopramide	3	94	3
22	Odansetron	9	76	15
23	Ranitidine	10	81	9
24	Pantoprazole	3	97	0

The reaction pattern of the study subjects is summarised in Table 2. Out of the 100 study subjects, 20% of study subjects showed positive reaction for diclophenac. 19% of study subjects showed positive reaction for ampicillin and paracetamol. 15% showed positive reaction for ketorolac. Ciprofloxacin (11%) and ranitidine (10%) followed next in case of positive reactions.

Metronidazole, glycopyrrolate and deriphyllin showed negative reaction in all study subjects. 99% of the study subjects showed negative reactions for amikacin, bupivacaine, lignocaine and propofol where as 98% showed negative reaction for midazolam.

DISCUSSION

Drug hypersensitivity reactions are most common in patients over 50 years of age and 63–70% of patients suspected of having an allergic reaction to the drugs are women⁵. Anaphylaxis by all causes is reported more frequently in adult females than males. This difference surfaces after puberty, suggesting that sex hormones may be involved.^{6,7} In a study done by Rajan et al in Trivandrum, 56% of cases of ADR was reported in females and 44% in males with, male-female ratio of 0.78.⁸ A study done in a teaching hospital in India showed similar result; out of the total cases reported females were more compared to males.⁹ In our study 86% of patients reported for intradermal test were females and 25% were of age 60 years and above.

Non-steroidal anti-inflammatory drugs (NSAIDs) and antimicrobials were the two groups which showed positive reactions in most of the patients in this study. Among antibiotics, β -lactams and fluroquinolones were prominent. In a systematic review of ADR in Indian population by Thejes et al, the major causative drug groups were antimicrobials (45.46%), NSAIDs (20.87%) and anti-epileptic drugs (14.57%). Commonly implicated drugs were sulfa (13.32%), β -lactams (8.96%) and carbamazepine (6.65%).¹⁰ A study done by Rajan et al found out that, among the distribution of different classes of drugs causing ADR, immunoglobulin was the most common class of drugs (55.3%) followed by vaccines (16.9%). Other common class of drugs reported were due to antibacterial (7.8%), and antiepileptic (7.5%).⁸ In a study done by Suh DC et al showed that antibacterial, and antiepileptic were shown as most implicated drug classes.¹¹ According to the study done by Sharma S et al, the most common drug group responsible for causing CADRs was antibiotics (47.58%) followed by

non-steroidal anti-inflammatory drugs (16.13%) and anticonvulsants (13.71%).¹²

CONCLUSION

Adults including elderly persons were the majority with positive skin test results with drugs. NSAIDs and antimicrobials showed reactions in most of the patients. The drugs which were commonly prescribed by the medical practitioners were found to be more prone for allergic reactions. Since the reactions can sometimes be fatal, it is important to know the drugs prone for ADR through intradermal testing. Prevention of future reactions is an essential part of patient management.

Recommendations: The patient should be provided with written information about which drugs are to be avoided. Those drugs should be noted in the hospital records. The mainstay of treatment for drug allergy is avoidance of the offending drug. When available, alternative medications with unrelated chemical structures should be substituted.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. KD Tripathi. Adverse drug effects. In: KD Tripathi. Essentials of medical pharmacology. 7th ed. New Delhi: Jaypee brothers' medical publishers (p) ltd; 2013: 82.
2. Khan DA, Solensky R. Drug allergy. *J Allergy Clin Immunol.* 2010;125:126–37.
3. Lazarou J, Pomeranz BH, Corey PN. Incidence of adverse drug reactions in hospitalized patients: a meta-analysis of prospective studies. *J Am Med Assoc.* 1998;279(15):1200–5.
4. Gandhi TK, Weingart SN, Borus J, Seger AC, Peterson J, Burdick E, et al. Adverse drug events in ambulatory care. *N Engl J Med.* 2003;348(16):1556–64.
5. Anderson JA. Allergic reactions to drugs and biological agents. *J Am Med Assoc.* 1992;267:2845–57.
6. Motosue MS, Bellolio MF, Van Houten HK, Shah ND, Campbell RL. Risk factors for severe anaphylaxis in the United States. *Ann Allergy Asthma Immunol.* 2017;119(4):356e361.e2.
7. Grabenhenrich LB, Dolle S, Moneret-Vautrin A, et al. Anaphylaxis in children and adolescents: The

European Anaphylaxis Registry. *J Allergy Clin Immunol.* 2016;137(4):1128e1137.

8. Rajan A, Ramani PT, Raj S. A study on pattern of adverse drug reaction in an adverse drug reaction monitoring centre of a tertiary care hospital in South Kerala, India. *Int J Basic Clin Pharmacol.* 2019;8(8):1813-8.

9. Gaur S, Paramjeet S, Srivastava B, Bhardwaj R, Ahuja S, Gunjita B. Evaluation of adverse drug reactions in teaching hospital in Kumaon region. *J Med Sci Clinic Res.* 2016;4:12139-45.

10. Patel TK, Thakkar SH, Sharma D. Cutaneous adverse drug reactions in Indian population: A systematic review. *Indian Dermatol Online J.* 2014;5(Suppl 2):S76-86.

11. Suh DC, Woodall BS, Shin SK, Hermes-De Santis ER. Clinical and economic impact of adverse drug reactions in hospitalized patients. *Ann Pharmacother.* 2000;34(12):1373-9.

12. Sharma S, Jayakumar D, Palappalli DS. Pharmacovigilance of cutaneous adverse drug reactions among patients attending dermatology department at a Tertiary Care Hospital. *Indian Dermatol Online J.* 2019;10:547-54.

Cite this article as: Shameem N, Krishna Kumar MK. Common drugs causing allergy in patients attending a tertiary care centre in South Kerala. *Int J Community Med Public Health* 2021;8:589-92.