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ORIGINAL ARTICLE

Morphologic Pattern of Adverse Cutaneous Eruption of Co-trimoxazole among Garments Worker of Dhaka city of Bangladesh

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Abstract

Background: Drug reaction of Co-trimoxazole or Trimethoprim and Sulphamethoxazole (TMP-SMX) vary in their appearance and severity. They can range from simple pruritus or rash to severe life-threatening condition and even death. **Objective:** The objectives of this study was to observe the morphologic pattern of adverse cutaneous eruption of co-trimoxazole among industrial workers. **Methodology:** This prospective observational study was conducted in department of Dermatology & Venereology, Monno Medical College, Manikganj, Bangladesh from January 2022 to December 2022 for a period of one year. This study was carried out on diagnosed cases of drug eruption after use of co-trimoxazole in DEPZ hospital in an industrial area of savar, Dhaka, Bangladesh. Adverse reactions to Co-trimoxazole were found in 44 patients with various morphology. **Results:** In this study majority patients were found in age group 20 to 30 years which were 28 (63.63%) followed by 31 to 40 years which were 10(22.72%) and 41 to 50 years which were 6(13.63%). Male were predominant than female which are 37(84.09%) and 07 (15.90%) respectively. The majority were labelled as fixed drug eruption in case of male 22 (50.00%) and female 03 (6.81%),and urticarial rash in case of male 5 (11.36%) and female 02 (4.54%). Others presentation with maculo-popular rash i in case of male 05(11.36%) and female 01 (2.27%). bullous eruption in case of male 05 (11.36%) and female 01 (2.27%). **Conclusion:** Adverse drug reactions are common complications in drug therapy. From this study it was observed, that Cotrimoxazole was a major etiological agent in causing cutaneous eruption. [*Journal of Current and Advance Medical Research, January 2024;11(1):17-21*]

Keywords: co-trimoxazole; cutaneous eruption, morphological pattern; industrial worker

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Introduction

Cutaneous drug reactions have become increasingly prevalent in recent years, affecting a significant portion of the population. Studies estimate that the incidence of these reactions is approximately 2.2%, with the rate notably higher among hospitalized patients[1]. Although most drug-induced skin reactions tend to be mild and benign, severe or even fatal reactions can do occur. The likelihood of such

reactions rises with the number of medications a person is prescribed. Adverse drug reactions are a common cause of dermatologic consultation. All drugs whether used topically or systemically are capable of producing noxious, unintended, undesired sequelae of symptoms in man[1-2]. An Adverse Drug Reaction (ADR) has been defined as''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'[2]. Simple exanthems (75%- 95%) and urticaria (5%-6%) account for the vast majority of drug eruptions[3].

Among all the adverse effects caused by medications, cutaneous reactions are the most frequently reported. Nearly any type of skin condition can be initiated, triggered, or worsened by the use of certain drugs. These reactions present a broad spectrum, ranging from mild rashes to severe life-threatening conditions, underscoring the need for vigilance when prescribing or using medications. ADRs are a significant cause of hospital admissions, and among these, cutaneous ADRs (affecting 2-3% of patients) are one of the more common reasons for patients to seek medical attention[4]. However, most ADRs tend to be minor and resolve on their own, there are instances where they can become severe or even life-threatening.

Regardless of how safe or effective a drug may be, there is always an inherent risk of adverse reactions. ADRs contribute significantly to both morbidity and mortality across all areas of healthcare today. It is estimated that between one-third and half of all ADRs are preventable. Several factors can influence the incidence and severity of these reactions, including patient-specific variables like age, sex, existing medical conditions, and genetic predispositions, as well as drug-related factors such as the type of medication, route of administration, duration of treatment, and dosage[5].

Trimethoprim-sulfamethoxazole (TMP-SMX) is an antimicrobial with an integral role in the care of many patients. It has an important role in the treatment of methicillin-resistant Staphylococcus aureus[6]. Trimethoprim-sulfamethoxazole combination is used to treat infections including urinary tract infections, middle ear infections (otitis media), bronchitis, traveler's diarrhea, and shigellosis, pneumocystis jiroveci pneumonia[7]. Trimethoprim-sulfamethoxazole may be administered orally without regard to meals. However, it is best to take it with at least 8 ounces of water. Administration of the two drugs is in a 1:5 (trimethoprim: sulfamethoxazole) as a tablet formulation[8]. Sulfamethoxazole is a sulfonamide (antimicrobial drug class) that works directly on the synthesis of folate inside microbial organisms, Trimethoprim is a direct competitor of the enzyme dihydrofolate reductase, resulting in its inhibition, which halts the production of tetrahydrofolate to its active form of folate[9]. However, TMP-SMX may be avoided by prescribers due to adverse reactions (AR). There are a wide variety of possible TMP-SMX AR, ranging from mild nausea to life-threatening toxic epidermal necrolysis[10]. The objective of this study was to observe the morphologic pattern of adverse cutaneous eruption of co-trimoxazole among industrial workers.

Methodology

Study Settings and Population: This prospective observational study was conducted in department of Dermatology & Venereology, Monno Medical College, Manikganj; Bangladesh. This study was carried out from January 2022 to December 2022 for a period of one year. A total number of 44 patients were selected from outdoor patient department (OPD) in the DEPZ hospital in an industrial area of savar, Dhaka, Bangladesh. Irrespective of gender, all adult (age more than 18 years) patient with complain of skin eruption associated with the history of taking cotrimoxazole (Trimethoprim and Sulphamethoxazole) were including in this study.

Study Procedure: After full filling inclusion criteria about 44 patients were selected. Patients were presented with various cutaneous eruption such as Fixed drug eruption (FDE), Maculopapular or exanthematous Rash, Urticaria and Bullous eruption. The term Fixed Drug Eruptions describes the development of one or more annular or oval, erythematous patches as a result of systemic exposure to a drug, which usually resolves with a residual hyperpigmentation[11]. *T*he characteristic early lesion is a sharply demarcated macule, round or oval in shape, occurring within minutes to hours after ingestion of the offending drug. The lesions may become edematous, thus forming a plaque, which may evolve to become a bulla and then a erosion and heals, with or without pigmentation[12].

Statistical Analysis: Computer based statistical analysis were carried out with appropriate techniques and systems. All data were recorded systematically in preformed data collection form (questionnaire) and quantitative data were expressed as mean and standard deviation and qualitative data were expressed as frequency distribution and percentage. Statistical analysis was performed by

using window-based computer software devised with Statistical Packages for Social Sciences (SPSS-17) (SPSS Inc, Chicago, IL, USA).

Ethical Consideration: All procedures of the present study were carried out in accordance with the principles for human investigations (i.e., Helsinki Declaration) and also with the ethical guidelines of the Institutional research ethics. Formal ethics approval was granted by the IRB of Monno Medical College. Participants in the study were informed about the procedure and purpose of the study and confidentiality of information provided. All participants consented willingly to be a part of the study during the data collection periods. All data were collected anonymously and analyzed using the coding system.

Results

A total number of 44 patients were recruited after fulfilling the inclusion and exclusion criteria. Among them predominant age group was 20 to30 years which were 28 (63.6%) followed by 31 to 40 years which were 10(22.7%) and 41 to 50 years which were 6(13.6%) (Table 1).

Table: 1. Distribution of Patients According to Age Group

Age Group	Frequency	Percent
20 to 30 Years	28	63.6
31 to 40 Years	10	22.7
41 to 50 Years	06	13.6
Total	44	100.0

Male were predominant than female which was 37(84.1%) and 7(15.9%) respectively. The ratio of male and female among the study population was 5.3:1 which showed that male were predominant than female (Table 2).

Table:2. Distribution of patients according to gender

Age Group	Male	Female
20 to 30 Years	23 (52.3%)	5(11.3%)
31 to 40 Years	9(20.5%)	1(2.2%)
41 to 50 Years	5(11.4%)	1(2.2%)
Total	**37(84.1%)**	**7(15.9%)**

The majority were labelled as fixed drug eruption in case of male 22 (50.0%) and female 3(6.8%) and urticarial rash in case of male 5 (11.4%) and female 02 (4.5%). Others presentation with maculo-popular rash in case of male 5(11.36%) and female 1(2.27%). bullous eruption in case of male 05 (11.36%) and female 1(2.3%) (Table 3).

Table 3: Morphological Pattern of Cutaneous Adverse Reaction of Trimethoprim and Sulphamethoxazole

Pattern of Cutaneous Adverse Reaction	Male	Female
Fixed Drug Eruption	22 (50.0%)	3(6.8%)
Urticarial Rash	5(11.3%)	2(4.5%)
Maculopapular Rash	5(11.3%)	1(2.2%)
Bullous eruption	5(11.3%)	1(2.2%)
Total	**37(84.0%)**	**7(15.9%)**

Discussion

This prospective observational study was undertaken to observe the cutaneous manifestations of drug reactions. TMP-SMX treated the infectious disease like UTI, RTI, folliculitis, shigellosis. It is a cheap medicine and very effective of various infected disease. A total number of 44 patients were recruited after fulfilling the inclusion and exclusion criteria. Among them predominant age group was 20 to30 years which were 28 (63.63%). In Tamilnadu, India a study was conducted in a medical university have been reported that commonly infected age group 11 to 40 years[13]. In this study, Male were predominant than female which are 37(84.1%) and 07 (15.9%) respectively. A slight male preponderance was observed, (M:F = 1.4 : 1) as already been reported on another study[12].

This study had demonstrated that adverse reaction of TMP-SMX is common with different morphology. Common AR are itching, skin rash, nausea, vomiting and. Although wide variety of TMP-SMX adverse reaction ranging from mild nausea to life-threatening toxic epidermal necrolysis possible. The incidence of FDE ranges from 2.5% to 22.0% of all cutaneous adverse drug reactions[14]. In this study male 22 (50.0%) and female 3(6.8%) were presented with FDE of TMP SMX. From a study it was observed, that Co-trimoxazole (25.0%) was a major etiological agent in causing FDE in the southern part of Tamilnadu[13].

Another study by Krantz et al[15] showed that 89.3% of patients with a history of immediate, delayed non-severe, or unknown reactions tolerated direct trimethoprim-sulfamethoxazole (TMP-SMX) oral challenge. McGee et al[16] explained his study the primary adverse effects of trimethoprim and sulfamethoxazole include maculopapular rash,

nausea vomiting more serious reactions can include Stevens-Johnson syndrome. Gallardo-Cartagena et al[17] showed a patient with an unknown sulfa allergy and treated with trimethoprim and sulfamethoxazole may experience anaphylaxis or less serious yet severe symptoms such as hives, itchy eyes, swelling of the mouth and/or throat, and abdominal cramping. Exanthematous/maculopapular/morbilliform drug eruption was the commonest (about 34.0%) morphological pattern of cutaneous ADR[18]. Despite the prevalence of cutaneous ADRs, studies on their epidemiology are limited, as successful research in this area requires collaboration between internal medicine clinics and consultant dermatologists, along with comprehensive ADR monitoring systems.

Conclusion

A wide spectrum of cutaneous manifestations ranging from maculopapular rash to severe toxic epidermal necrolysis can be produced by Trimethoprim and Sulphamethoxazole**.** Severe adverse drug reaction may result in serious morbidity and even death. Prompt identification and withdrawal of the offending agent help to limit the toxic effects associated with drug.

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None

Conflict of Interest
The authors have no conflicts of interest to disclose

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Data Availability
Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate
Ethical approval for the study was obtained from the Institutional Review Board. As this was a prospective study the written informed consent was obtained from all study participants. All methods were performed in accordance with the relevant guidelines and regulations.

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