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Study of adverse drug reactions in patients with diabetes attending a tertiary care hospital in New Delhi, India

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The present prospective observational study was carried out in a tertiary care hospital in New Delhi, India from May 2014 to June 2015 to report adverse drug reactions (ADRs) in patients with type 2 diabetes mellitus (T2DM) using antidiabetic drugs. A total of 220 patients (121 males, 99 females) were enrolled. ADRs were recorded on the prescribed form. Causality and severity assessment was done using Naranjo's probability scale and modified Hartwig and Siegel's severity scale, respectively. Commonly prescribed drugs were biguanides, peptide hormone and sulphonylurea. A total of 26 ADRs were recorded (16 in males and 10 in females). Most commonly observed ADRs were related to endocrine and gastrointestinal system. Severity assessment of ADRs showed seven (26.9%) ADRs as moderate, and 19 (73.1%) as mild. No severe reactions were observed. ADRs were mostly related to endocrine and gastrointestinal system. More information on prescribed drugs and their side effects is required for ensuring patient safety.

Key words Adverse drug reaction - antidiabetic drugs - risk factors - T2DM

The prevalence of type 2 diabetes mellitus (T2DM) is increasing globally and has reached epidemic proportions in many countries[1,2]. Worldwide, 415 million people have diabetes and the number of people with the disease is set to rise beyond 642 million by 2040[3]. In India, more than 65.1 million individuals have been diagnosed with the disease[4] and the estimates suggest 89 million patients by 2030 and about 56 per cent patients will be from urban regions[5]. Similar to other countries, the aetiology of diabetes in India is multifactorial and includes genetic factors coupled with environmental influences such as obesity associated with rising living standards, steady urban migration and lifestyle changes[6,7].

The present, prospective, observational study was carried out at Hakeem Abdul Hameed (HAH) Centenary Hospital, Jamia Hamdard, New Delhi, India, between May 2014 and June 2015 to report the adverse drug reactions (ADRs) and to evaluate their pattern in T2DM patients on antidiabetic treatment.

All adult patients (≥25 yr), with T2DM, attending medicine outpatient department, emergency department, admitted in Intensive Care Unit, and Medical ward during the study period of HAH Hospital

and willing to share the disease history were included in the study. The details of ADRs were collected from the patients as per the requirements specified in Pharmacovigilance Programme of India (PvPI) prescribed spontaneous reporting form[8]. Patients below 25 yr, and those taking herbal drugs or drugs of abuse were excluded from the study.

The disease history and demographic details of all the patients were taken. In case of ADR, the details such as time of initiation of ADR, causative drug, dose and route of administration and duration were filled in the PvPI prescribed Suspected ADR Reporting Form[8]. The duly filled form was submitted through ADR Monitoring Centre, Jamia Hamdard to National Coordination Centre from where the reporting is done to Uppsala Monitoring Centre (UMC) using a web based system 'VigiFlow software version 5.3'maintained by UMC in Uppsala, Sweden. The study was approved by the institutional ethics committee.

The ADRs were classified on the basis of System Organ Class (SOC)[9] and according to the drug class[10]. Causality assessment was done as per the Naranjo's scale[11] and severity assessment using Modified Hartwig and Siegel's scale[12].

A total of 220 patients with T2DM were registered for the study based on inclusion and exclusion criteria and evaluated, of whom 121 (55%) were males. One hundred and fifty six (70.9%) patients were aged 25 and 60 yr and elderly patients (> 60 yr) were 64 (29.1%). Duration of diabetes was between 16 and 20 yr in 19 patients, 11-15 yr in 42, 6-10 in 63 patients and ≤5 yr in 96 patients. During the study, 26 ADRs (11.8%) were recorded, of which 16 ADRs were seen in males and 10 in females. Maximum ADRs (about 42.31%, 11 ADRs) were seen in elderly patients (>60 yr), 26.92 per cent (7 ADRs) in the age group between 41 and 50 yr, 19.23 per cent (5 ADRs) between 51 and 60 yr and 11.54 per cent (3 ADRs) between 31 and 40 yr. Among 126 patients on monotherapy, ADRs were observed in 16 patients; however, in 94 patients on combination therapy ADRs were seen in 10 patients. As per SOC, the most commonly seen ADRs were related to endocrine system particularly hypoglycaemia (n=9; 34.6%) and gastrointestinal system (n=5; 19.2%), particularly loss of appetite (n=2) and epigastric pain (n=3) of the total ADRs were observed. Besides these, ADRs related to skin and appendages (n=4; 15.3%), musculoskeletal (n=4; 15.3%), cardiovascular (n=3; 11.5%) and respiratory system (n=1; 3.8%) were also seen.

Classification of ADRs according to drug class showed that nine of 70 patients (12.86%) treated with biguanides (drug: metformin; 12.86%), four of 21 patients (19.05%) treated with sulphonylureas (drug: glimepiride, gliclazide), three of 35 patients (8.57%) treated with peptide hormones experienced ADRs. Among combinations, sulphonylurea + biguanide combination produced 11.76 per cent (4 of 34 patients treated) ADRs as compared to dipeptidyl peptidase-4 inhibitor + biguanide (10%) and biguanide + sulphonylurea + thiazolidinedione (10%) combinations.

Of the 26 ADRs, eight (30.8%) were categorized as probable when evaluated at the Naranjo's scale of probability of ADR and the remaining 18 (69.2%) were categorized as possible. On severity assessment seven (26.9%) ADRs were moderate, and 19 (73.1%) were mild. No severe reactions were observed. ADRs seen in 11.8 per cent T2DM patients on antidiabetic treatment were in agreement with previous reports[13-16].

Evaluation of ADRs is important for the assessment of risk factors to ensure maximum benefits of drug therapy. More data on prescribed drugs and their side effects will help in reducing the ADR occurrence and ensure patient safety.

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***Conflicts of Interest*:** None.

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