

## **“A Analytic study on the Drug research among diabetes patients from the Delhi region”**

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### **Abstract**

Since ancient times, people have been aware of diabetes mellitus (madhumeha), and Sushruta stated in the Ayurveda the sweetness of diabetic urine. However, its pharmacotherapy is only a little over 80 years old. Greek physician Aeretæus first used the phrase "diabetes" (to flow through) in the first century A.D. Willis noted in the 17th century that diabetics' urine was "wonderfully pleasant as though impregnated with honey or sugar." Dobson established in 1755 that diabetics' urine contained sugar (Satoskar et al., 2005 a). The American Diabetes Association (ADA) Expert Committee defined diabetes mellitus (DM) as "a collection of metabolic illnesses characterised by hyperglycemia resulting from abnormalities in insulin production, insulin action, or both" in their 1997 recommendations. Long-term harm, dysfunction, and failure of many organs, particularly the kidney, nerves, heart, and blood vessels, are linked to chronic hyperglycemia. As a result, DM encompasses a variety of diverse disorders (Balkau and Eschwege, 2005 a).

**Keyword:** - Diabetes mellitus, Impregnated, Abnormalities, Diverse, Disorders.

### **Introduction**

Given that diabetes mellitus (DM) is a metabolic condition marked by hyperglycemia, glycosuria, hyperlipemia, a negative nitrogen balance, and occasionally ketonemia. A widespread pathological change that causes vascular complications like lumen narrowing, early atherosclerosis, sclerosis of glomerular capillaries, retinopathy, neuropathy, and peripheral vascular insufficiency is thickening of capillary basement membrane, increase in vessel wall matrix, and cellular proliferation. The pathogenic alterations of DM are thought to be caused by increased nonenzymatic glycosylation of tissue proteins as a result of persistent exposure to high glucose concentrations and the buildup of greater amounts of sorbitol (a reduced product of glucose) in tissues. The amount of glycosylated haemoglobin (HbA1C) is used as a measure of protein

glycosylation since it reflects the glycemic status during the previous two to three months (Tripathi, 2003 a) One of the main causes of death and disability in India is well acknowledged to be DM. On death certificates, diabetes mellitus is most likely underreported as the primary cause of death because heart disease and stroke account for roughly 65 percent of DM patients' fatalities.

DM is linked to persistent issues that have an impact on practically all body systems. Blindness, heart and blood vessel disease, stroke, renal failure, amputations, and nerve damage are all frequent outcomes of the illness. Pregnancy complications can arise from uncontrolled DM, and babies born to DM-affected mothers are more likely to have birth abnormalities. There are two main forms of DM:

### **Type I: Juvenile-onset diabetes mellitus (IDDM), insulin dependence**

The majority of cases of  $\beta$ -cell destruction in pancreatic islets are autoimmune (type 1 A), where antibodies that cause  $\beta$ -cell destruction are identified in the blood, but some cases are idiopathic (type 1 B), where no antibodies that cause  $\beta$ -cell destruction are found. Circulating insulin levels are always low or very low in type I instances, and patients are more likely to experience ketosis. This variety has a lower prevalence and a weaker hereditary tendency.

### **Type II: Mature onset, non-insulin dependent diabetes mellitus:**

There is no loss or mild reduction in cell mass; the level of insulin in the blood is low, normal, or even high; there is no evidence of an anti-cell antibody; there is a high degree of hereditary predisposition; and, often, the onset is late (past middle age). The majority of patients are type II DM. Possible causes include:

- A defect in the gluco-receptors of cells, which causes them to react to greater glucose concentrations.
- Lessened sensitivity of peripheral tissues to insulin due to decreased insulin receptor number and insulin receptor downregulation. Many hypertensives have high insulin levels but normal glucose levels; many also show insulin resistance. Angiopathy has been linked to chronic hyperinsulinemia. Obesity and an excess of hyperglycemic hormones (glucagons, etc.) lead to a relative lack of insulin, which causes the cells to lag behind (Tripathi, 2003b).



There has been a rise in type II (DM) during the past 20 years, albeit the rate varies between nations and within ethnic groups within a single nation.

### **Global DM Prevalence**

According to predictions made by the World Health Organization (WHO), the number of people with type 2 diabetes worldwide would more than quadruple from 135 million in 1995 to 300 million by 2025. (King et al., 1998).

In the years to come, putting more emphasis on health education and lifestyle improvements may have benefited wealthy nations, where the anticipated rise in prevalence is less than 27% from 6 to 7.6% compared to the developing world's 48% from 3.3-4.9%. There are estimated to be 33 million adults with DM worldwide, with India experiencing the largest growth. By 2030, this figure is anticipated to reach 79.4 million.

The information sources that must be employed for qualitative research are largely the same as those for quantitative studies, but they must also be complemented with sources that offer a trustworthy evaluation of the effectiveness and safety of the products in question.

Studies on the quality of prescribing are better established at the national level than the worldwide level, and some findings on the supply quality and the quality of the most commonly prescribed pharmaceuticals are available (Laporte et al., 1983).

### **Review of Literature**

According to Benet (1996), Kastury et al. (1999), Ansari et al. (1999), prescribing behaviour of doctors is influenced by input from a variety of sources, including patients, professional colleagues, academic literature, commercial publicity, and governmental regulations. Ineffective utilization of these inputs leads to a variety of prescription errors, which are quite prevalent in clinical practice. However, ongoing prescription and drug consumption studies could aid in identifying the issues involved in therapeutic decision-making and encourage judicious prescribing (Singh et al., 1997, Bapna et al., 1994). Therefore, it is crucial to analyze drug usage for clinical, educational, and pharmaco-economic reasons. To raise awareness for the responsible use of pharmaceuticals, monitoring prescriptions and researching drug use could spot

connected issues and give the doctor feedback (Mhetre et al., 2003, Biswas et al., 2000).

The World Health Organization's (WHO) 2000 diagnostic guidelines for DM (and normalcy) are displayed in table 3.1. The figures are based on the cut-off point for the risk of vascular disease. A fasting plasma glucose level of 7.0 mmol/l or higher, a random plasma glucose level of 11.1 mmol/l or higher, or an unfavourable test of oral glucose tolerance. Intermediate glucose tolerance test results are categorised as "impaired glucose tolerance" (IGT) and point to the need for additional assessment. It may be necessary to keep such patients under evaluation and repeat the OGTT at a later period because many IGT patients eventually develop frank DM.

Fasting hyperglycemia, also known as impaired fasting glucose, is another aberrant finding that occurs when the fasting plasma glucose is between 6.1 and 6.9 mmol/l. vascular disease is more likely to develop in people with impaired fasting glucose. Some cases of type 2 DM will go undiagnosed if fasting blood glucose readings alone are used, as recommended by the American Diabetes Association.

When the pancreatic  $\beta$ -cells are under stress, such as during pregnancy, an infection, a myocardial infarction, or other serious trauma, or when using diabetogenic medications like corticosteroids, an aberrant result may be seen in certain individuals, whose OGTT is typically normal. After the acute illness has passed, this "stress hyperglycaemia" typically goes away, although blood sugar levels should be checked again.

The proposed diagnostic standards for DM in pregnant subjects are stricter than those for non-pregnant persons. Women who are pregnant and have abnormal glucose tolerance should be sent right away to a specialised centre for a thorough evaluation.

An accurate and objective measurement of glycemic control over a period of weeks to months is provided by glycated haemoglobin. This can be used to evaluate glycaemic control in a patient with known diabetes, but it's not sensitive enough to diagnose the condition, and it's typically normal in people with impaired glucose tolerance. Ion-exchange chromatography can separate a few small components of adult haemoglobin (HbA1) from unmodified haemoglobin (HbA0), and these haemoglobin moieties are augmented in DM by the gradual non-enzymatic covalent attachment of glucose and



other carbohydrates (glycation). Glycated haemoglobin is currently reported by laboratories as total glycatedhaemoglobin (GHb), HbA1C, or HbA1. HbA1C is now the most popular measurement in the UK. HbA1C production is directly correlated with ambient blood glucose levels; a 1% increase in HbA1C corresponds to an about average increase of 2 mmol/l in blood glucose. The estimation of HbA1C concentration is weighed by changes in glycaemic control that occurred in the month before measurement (representing 50% of the HbA1C concentration), even though HbA1C concentration reflects the integrated blood glucose management across the life cycle of the erythrocyte (120 days). Recent occurrences have a greater impact on HbA1C than those from the past.

### **Statement of the Problem**

The definition of compliance is "the degree to which the patient's behavior (in terms of taking drugs, adhering to dietary restrictions, or implementing other lifestyle modifications) coincides with clinical prescription" (Sackett and Haynes, 1976). Few research have concentrated on the factors that influence compliance, yet several studies demonstrate that only a small portion of patients who are prescribed pharmacological treatment actually take it (Kellaway and McCrae, 1979, Cockburn et al., 1987, Cheung et al., 1988 ).

According to the methods used to gather the data, the sources of information for the measurement of drug compliance have historically been divided into two primary divisions (Pearson, 1982). The use of indirect procedures includes tracking clinical outcomes, identifying physiological markers, documenting physician assessments, conducting structured patient interviews, preventing prescription re-fills, counting pills, and monitoring medicines (Cramer et al., 1989). Measurements of the drug or its metabolites in the blood or urine are examples of direct procedures.

### **Significance of Study**

We all use medications on a daily basis. But how many and what kinds of pharmaceuticals are consumed by people? How much do they cost? Who has an impact on how they are prescribed and consumed? The unexpected response is that we still lack a lot of information. Another important issue that the medical profession currently faces is the absence of updating their knowledge about new and existing



pharmaceuticals, as well as the impact they have on patients. Initiative steps need to be taken in this direction.

One of the main motivations for researching medication utilizations is the establishment of the twin notions of therapeutic formularies and essential drug lists. After all, selecting a list of drugs will require significant guidance, informed not only by epidemiological data and scientific assessments of efficacy and safety, but also by current drug usage trends that are likely to reflect what the community wants and needs.

### **Objectives of the Study**

The following are the goals and objectives of the current "Drug Utilization Study."

A. To ascertain the current methods of treatment for DM patients and to evaluate the patterns of prescriptions made by various doctors. To accomplish this goal, the following diabetic clinics in the Delhi region were visited by type 1 and type 2 diabetics who participated in the current drug utilization study (pharmacoepidemiological study):

1. St. Stephens Medical Center (SSH).
2. Hindurao Medical Center (HRH)
3. Gangaram Medical Center (GRH)
4. The All India Institute of Medical Sciences (AIIMS)
5. Moolchand Medical Center (MCH)
6. Holy Family Hospital, (HFH)
7. Hospital Lady Hardinge(LHH)
8. Balaji Action Hospital, (BAH)

B. To monitor and oversee the usage of antidiabetic medications by diabetic patients on a regular basis in order to ascertain the patients' "Drug Adherence Rate."

C. To ascertain:

1. The level of attention a doctor provides their patients
2. The presence of health facility indicators in various hospitals

3. The proportion of patients with moderate diabetes who are exclusively receiving non-drug, non-pharmacological treatments
  - A. To calculate the price of a prescription in order to research the pharmacoeconomics of the medication.

### **Research Methodology**

The Department of Endocrinology at the following hospitals were chosen for the study: St. Stephens Hospital (SSH), Hinduo Hospital (HRH), Gangaram Hospital (GRH), All India Institute of Medical Sciences (AIIMS), Moolchand Hospital (MCH), Holy Family Hospital (HFH), Lady Hardinge Hospital (LHH), and Balaji Action Hospital (BAH). For our research, a prospective investigation was conducted, but the Endocrinology Research Center also conducted a retrospective study. According to the inclusion and exclusion criteria, prescriptions from recently registered patients as well as patients who receive routine follow-up were included in the study. From the patients' prescriptions, information was also gathered on demographic factors such as age, sex, height, weight, blood pressure, blood sugar level, and family history.

### **Limitation of Study**

Type 1 and type 2 diabetics attending the designated eight diabetic clinics in the Delhi region participated in the current drug use study regarding the use of antidiabetic drugs to ascertain:

1. The current treatment practice and prescribing patterns of various clinicians,
2. The level of medical attention given to patients and the presence of facility indicators in the eight diabetic clinics,
3. The patients' "drug adherence rate,"
4. The number of people with moderate diabetes who are recommended non-pharmacological treatments (just diet and exercise) and
5. The price of the medication in order to examine its pharmacoeconomics.

### **Conclusion**



In a non-profit tertiary care facility, the DUR of anti-diabetic medications was investigated. Both the ratio of oral to inject able insulin and the prescriptions for different oral hypoglycaemic medications were sensible recommendations. The study's conclusions point to the necessity of raising awareness of generic prescribing and NLEM prescribing. In order to understand the present prescribing patterns of physicians and offer feedback that will help to encourage rational medication usage, it is advised that DUR be conducted on the prescribing trends of anti-diabetic drugs and other illness conditions on a regular basis. Due to the study's restriction to antidiabetic medications solely, the average medicine prescribed in our research was lower. While additional medications like multivitamins and carbamazepine were included in the Sutharshan et al trial.

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