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Retrospective study to identify the aetiology of diabetes mellitus among middle aged groups

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Abstract
Diabetes Mellitus (DM) is a multifactorial metabolic disorder that poses a major global health challenge, particularly among middle-aged individuals who are vulnerable due to lifestyle changes, stress, and aging physiology. This retrospective study aimed to identify the aetiological factors contributing to Type 2 Diabetes Mellitus (T2DM) in the middle-aged group (40-60 years). A total of 60 patient records diagnosed with T2DM were analyzed for demographic data, lifestyle factors, family history, comorbidities, and homeopathic management. The findings revealed that obesity was a predominant factor, with 91.6% of participants having a BMI ≥25. Poor glycemic control was observed in 75% of cases (HbA1c >6.5%), while 86.6% had fasting blood sugar ≥126 mg/dL. Family history of diabetes was noted in 43.3% of patients, and lifestyle habits such as smoking and alcohol use were present in 36.6%. Comorbidities, especially degenerative diseases (85%), obesity (60%), and hypertension (53.3%), were strongly associated with diabetes progression. Homeopathic remedies, predominantly Sulphur (46.6%) and Lycopodium (18.3%), were commonly prescribed, with 200C potency being the most frequently used. This study concludes that the onset and progression of T2DM in middle-aged adults are significantly influenced by modifiable lifestyle factors, obesity, and comorbidities, along with genetic predisposition. Early lifestyle interventions, awareness programs, and integrated management approaches, including homeopathic treatment, may play a pivotal role in reducing the burden of diabetes among this population.

Keywords: Diabetes mellitus, middle-aged adults, obesity, lifestyle factors, family history, comorbidities, homeopathy

Introduction
Diabetes Mellitus (DM) is a chronic metabolic disorder characterized by persistent hyperglycemia due to defects in insulin secretion, insulin action, or both [1]. It is one of the most prevalent non-communicable diseases, contributing significantly to morbidity and mortality worldwide. According to the International Diabetes Federation (IDF), over 537 million adults were living with diabetes in 2021, with middle-aged individuals (40-60 years) being disproportionately affected [2]. The term Diabetes Mellitus originates from the Greek word "diabetes" (to pass through) and the Latin word "mellitus" (honey), describing the excessive passage of sweet urine [3]. Historically, references to "Madhumeha" (honey urine) can be traced back to ancient Indian Ayurvedic texts [4]. The aetiology of Type 2 Diabetes Mellitus (T2DM) is multifactorial, involving genetic predisposition, obesity, sedentary lifestyle, unhealthy diet, stress, and environmental factors [5, 6]. Middle-aged adults are at a crucial stage where these risk factors accumulate, increasing vulnerability to diabetes and its complications such as cardiovascular disease, nephropathy, and retinopathy [7]. Given the rising burden, understanding the contributory factors in this age group is vital for prevention, early diagnosis, and effective management. This study retrospectively analyzes the aetiology of T2DM among middle-aged individuals, with a focus on lifestyle, genetic, and environmental influences.

Materials and Methods
Type of study: Retrospective study
Study setting:
The study will be conducted on Sarada Krishna Homoeopathic Medical College, Kulasekharam.
Study Duration: 5 Month

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Sample size: 60 cases

Inclusion criteria
Adults aged 30 - 60years.
Diagnosed with Type 2 Diabetes Mellitus in the past 5-10 years.
Available medical records with complete data on family history, lifestyle factors, and clinical markers of diabetes (e.g., HbA1c levels, fasting blood glucose).

Exclusion criteria
Individuals diagnosed with Type 1 Diabetes Mellitus or other forms of diabetes.
Pregnant women or individuals with other chronic diseases that may confound the data (e.g., cancer, severe hypertension).

Observation and Results
Distribution According to Sex
This table illustrates an equal gender distribution among the 60 study participants diagnosed with Type 2 Diabetes Mellitus, comprising 30 males and 30 females. This even split indicates that in this sample, both sexes are equally affected by T2DM during middle age, reinforcing the notion that gender is not a significant differentiating factor in prevalence within this age group.
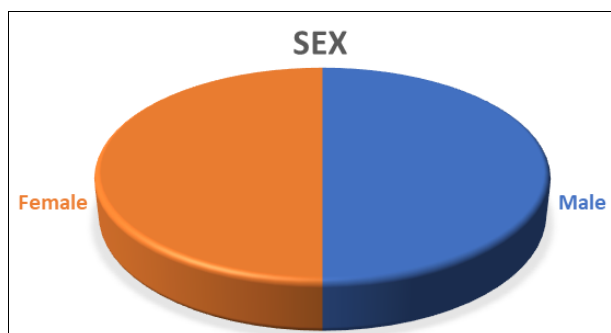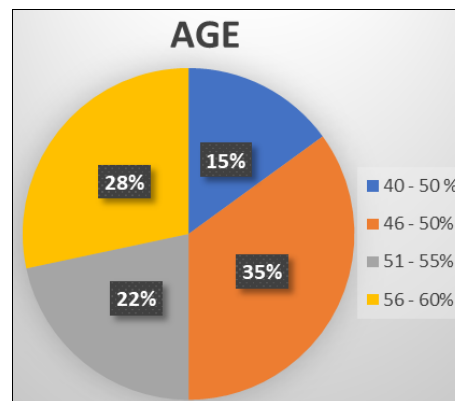

Graph 1: Distribution According to Sex

This graph visually represents the gender distribution among the 60 diabetic patients studied. The bar graph shows an equal split between male and female participants, with 30 cases each. This symmetry indicates no gender dominance in the prevalence of Type 2 Diabetes Mellitus within the middle-aged group, suggesting both sexes are equally at risk.

Distribution according to age
This table shows the age-wise distribution of participants. The majority of cases (35%) were in the 46-50 age group, followed by the 56-60 group (28.3%), indicating that diabetes becomes more prevalent in the later part of middle age. The trend suggests an increasing risk of T2DM as individuals approach their late 40s and 50s, aligning with age-related metabolic changes.

| Age	No. of cases
40 - 45	9
46 - 50	21
51 - 55	13
56 - 60	17

Graph 2: Distribution According to Age

The age distribution graph illustrates the clustering of diabetes cases within specific age brackets. The highest number of cases (21) falls in the 46-50 age range, followed by 17 in the 56-60 group. This pattern suggests that the incidence of Type 2 DM peaks during the later years of middle age, possibly due to cumulative lifestyle effects and metabolic changes.

Distribution According to BMI
The BMI table demonstrates that a vast majority of participants (91.6%) fall into the overweight or obese category (BMI ≥ 25). Specifically, 63.3% had a BMI between 25.0-29.9 and 28.3% had BMI between 30.0-34.9. Only 8.3% were within the normal BMI range. This emphasizes the strong link between increased body weight and the onset of T2DM in middle-aged individuals.

BMI RANGE	No.of.cases
18.5 - 24.9	5
25.0 - 29.9	38
30.0 - 34.9	17
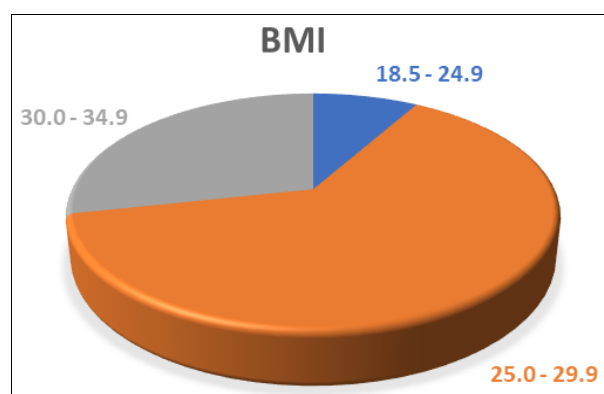
**Graph 3:** Distribution According to BMI

This graph demonstrates the BMI distribution among the subjects, highlighting that the majority are overweight or obese. Specifically, 38 participants fall in the 25.0-29.9 range, and 17 in the 30.0-34.9 range. Only 5 individuals have normal BMI. The skewed distribution underlines obesity as a significant risk factor contributing to T2DM in middle-aged adults.

Distribution According to family history
About 43.3% of the patients had a positive family history of

diabetes, while 56.7% did not. This supports the significant genetic component in the development of Type 2 DM, though it also confirms that lifestyle and environmental factors contribute substantially to the disease's onset even in the absence of heredity.

| Family history	No. of. cases
Present	26
Absent	34
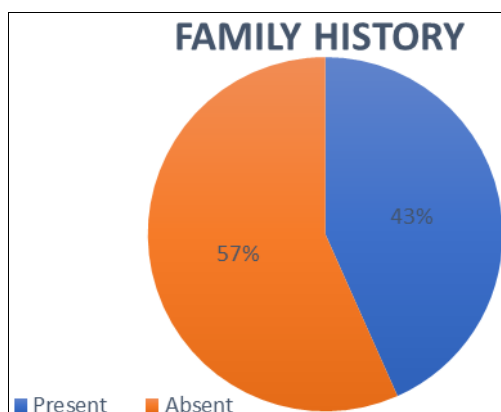
The family history graph shows that 26 participants had a positive family history of diabetes, while 34 did not. Though the numbers are nearly balanced, the presence of a family history in 43.3% of cases indicates a strong genetic predisposition as a contributing factor in disease onset.

Distribution According to Habits (smoking, Alcohol):
A total of 36.6% of the participants reported lifestyle habits such as smoking or alcohol use, while 63.3% did not engage in such behaviors. The presence of these habits among more than one-third of diabetics indicates a role of modifiable behavioral risk factors in disease progression.

Habits	No.of.cases
Present	22
Absent	38
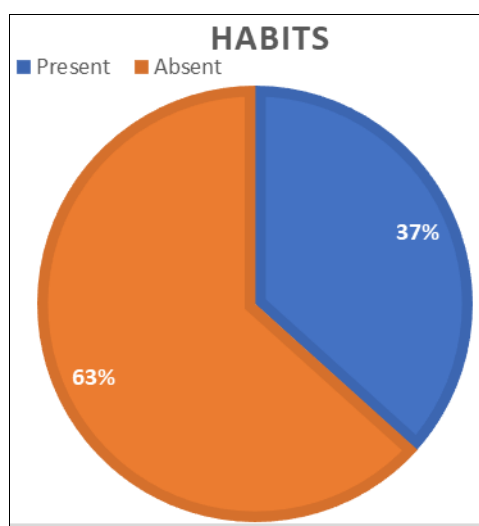
This graph indicates that 22 patients (36.6%) had lifestyle habits such as smoking or alcohol use, while 38 patients did not. The presence of these habits in over one-third of the population reflects the role of modifiable behavioral risk factors in the development and aggravation of T2DM.

Discussion
This study demonstrates that obesity, family history, and comorbidities such as hypertension and osteoarthritis are the major contributors to Type 2 Diabetes Mellitus (T2DM) among middle-aged adults. More than 90% of participants were overweight or obese, confirming the strong role of sedentary lifestyle and poor dietary habits in disease onset. A positive family history in 43.3% of cases highlights genetic susceptibility, while lifestyle habits like smoking and alcohol further aggravated risk. Despite most participants being "occupationally active," the lack of quality physical activity suggests that activity type, rather than occupation alone, influences metabolic health.

Conclusion
The findings conclude that T2DM in middle-aged individuals is primarily associated with modifiable risk factors—obesity, poor lifestyle choices, and stress—along with non-modifiable factors like genetics. Early interventions, awareness programs, and lifestyle modifications can reduce the disease burden in this age group. Homeopathy, as observed, may serve as a supportive management approach in chronic cases.

Conflict of Interest
Not available

Financial Support
Not available

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