IDENTIFICATION OF FAMILIAL FACTORS IN EARLY ONSET DIABETES

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Background

- Genetic and familial factors play a crucial role in the aetiology of Diabetes, which is characterized by hyperglycemia, insulin resistance and impaired insulin secretion.
- Studies show that individuals with a family history of diabetes are at higher risk, which interact with lifestyle factors and other comorbidities.
- Hence, incorporating risk assessment based on pedigree analysis may be essential for preventative strategies.

Aim

- To investigate the role of familial component in the development of early onset Diabetes Mellitus, focusing on the family history and pedigree analysis.

Methodology

- Proforma was prepared including lifestyle factors, medical history and family pedigree.
- Details were collected from **66** individuals, visited the departments of MHC, using the proforma.
- Collected details and pedigrees were analysed for identifying the role of genetics in Type 2 Diabetes Mellitus.
- Counselling on management, screening and preventive measures for at risk individuals in the family was provided.

Results

- In this study, **66** individuals with Type 2 Diabetes Mellitus (T2DM) were evaluated, including **32 young onset** who were diagnosed as diabetic at **≤ 40 years.**
- The mean age of onset was **35.5 years.**

Results

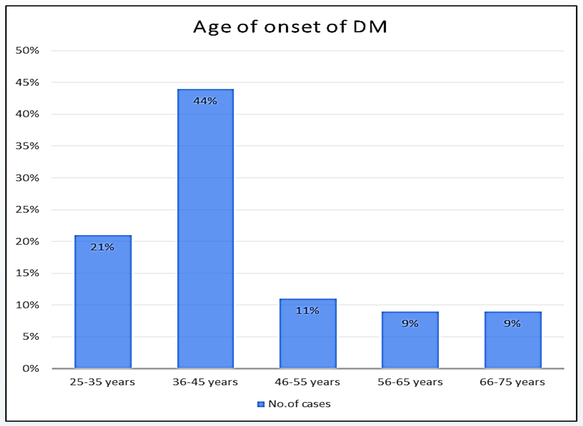

Figure 1. Majority (44%) were diagnosed in the age group of 36-45 years, followed by those between 25-35 years (21%) indicating that MODY may be highly prevalent in Indian population.

Probands with	DM Percentage (%)	Young DM Percentage (%)
Family history +ve	**86%**	**84%**
Only father affected	**19%**	**34%**
Only mother affected	3%	0%
Both parents affected	10%	22%
Only siblings affected	**16%**	4%
Only offsprings affected	3%	0%
Other family members affected	2%	4%
Single parent + 1 Sibling affected	**22%**	18%
Single parent + >1 Sibling affected	9%	11%
Both parents + 1 Sibling affected	2%	0%
Both parents + > sibling affected	9%	7%
Parents+ Siblings +offsprings affected	5%	0%

Table 2. Analysis on family history - Family history of diabetes was prevalent in 86% of cases, with highest risk observed when both a parent and sibling were affected (22%), followed by paternal influence (19%) and affected siblings alone (16%). 84% positive family history in young onset T2DM with paternal diabetes (34%) increasing the risk.

Category	No. of cases	FH of only DM	FH of only HTN	FH of both (HTN+DM)
DM + HTN	35 (53%)	9 (26%)	7 (20%)	19 (54%)
DM – HTN	31 (47%)	10 (32%)	2 (7%)	19 (61%)

Table 4. Analysis on comorbidity- Family history of both diabetes and hypertension was prevalent in over 50% of diabetic patients,

Age groups of onset	Number of probands	Positive Family history	No Family history
25-35	14 (21%)	11 (78%)	3 (22%)
36-45	29 (44%)	**26 (90%)**	3 (10%)
46-55	11(16%)	**10 (91%)**	1 (9%)
56-65	6 (9%)	5 (83%)	1(17%)
66-75	6 (9%)	5 (83%)	1 (17%)

Table 1. Individuals developing diabetes between 36-55 years have 90% likelihood of a positive family history.

Diabetes (N=66)	Males (68%)	Smoking / Alcohol (33 %)	FH +ve (73%)
			FH -ve (27%)
		Non-Smoking/ Alcohol (67%)	FH +ve (83%)
			FH -ve (17%)
	Females (32%)	Smoking / Alcohol (10%)	FH +ve (100%)
			FH -ve (0%)
		Non-Smoking/ Alcohol (90%)	FH +ve (100%)
			FH -ve (0%)

Table 3. Analysis on lifestyle factors versus family history, revealed that the family history contributes more than lifestyle factors in developing diabetes.

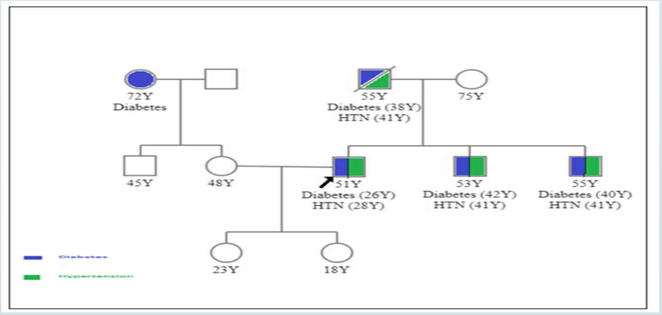

Figure 2. The proband was diagnosed with diabetes at 26 years and hypertension at 28 years, with a positive family history of diabetes and hypertension in his father and siblings diagnosed at younger ages. Counselling was done on management like regular medications., blood check-ups, cardiac evaluation and lifestyle modifications to prevent further complications. Genetic testing for MODY and ACE genes advised for personalized treatment.

Highlights

- A positive family history was present in **86%** of cases, with the highest risk when a single parent and a sibling were affected. **84%** positive family history in **young onset T2DM with paternal diabetes (34%)** increasing the risk.
- Family history contributed more to T2DM development than lifestyle factors.
- Highlighting hypertension as a significant comorbidity in diabetes and emphasizing the need to consider complex familial health histories in risk assessment and prevention strategies.

Conclusion

- The findings from our study on young onset complex disorders underscore the critical role of family history and genetic counseling in both prevention and management strategies.
- The high prevalence of positive family history in young onset diabetes highlights the importance of genetic component in the development of these diabetes at a younger age.
- The interplay between genetic factors and lifestyle choices further emphasizes the need for personalized interventions and genetic counseling to reduce risks and improve outcomes.
- Integrating genetic counseling and family history assessments into clinical practice is crucial for early detection, prevention and personalized management with screening recommended starting at age **25.**

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