AN INVESTIGATION OF HYPOGLYCEMIA INCIDENCES IN DIFFERENT AGE GROUPS

DEĞİŞİK YAŞ GRUPLARINDA HİPOGLİSEMİ İNSİDANSININ ARAŞTIRILMASI

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SUMMARY

Five hour oral glucose tolerans tests (OGTT) were performed on 20 cases which were chosen from the Faculty members and students having normal fasting glucose levels. After an overnight starvation and after ½ ,1 , 2 , 3 , 4 ,5 hours from the administration of 100 g / 250 ml glucose, the blood glucose levels were performed with glucose oxidase method.

Out of 20 cases, 7 had normal OGTT profiles 12 cases were found to have reactive hipoglicemia. One case had fasting hypoglycemia.

Between the reactive hypoglycemia related to early diabetes mellitus (DM) due to the high incidence of reactive hypoglycemia in our results, it is concluded that number of cases must be increased and high precaution must be taken in the diagnosis of hypoglycemia depending on OGTT results.

When the OGTT results were analyzed according to age groups, no significant difference was observed both in normal and in the familial DM cases. The hypoglycemia incidence was 54 % in the group between 15-25 years, 78 % in that of 26 - 45 years.

Serum creatine kinase activities were also determined in 9 cases. No correlation could be found between the plasma glucose concentration and the creatin kinase activities.

A survey of the three hour OGTT results was done on the 104 cases obtained from Istanbul Diabetic Society having normal fasting blood glucose levels. There was also no significant difference on the OGTT results between the age groups.

ÖZET

Fakültemiz elemanları ve öğrencileri içinden açlık kan şekeri normal sınırlar içinde olan 20 olgu seçilerek 5 saatlik oral glukoz tolerans testine (OGTT) tabi tutuldu. Gece açlığından sonra ve 100 g / 250 ml glukoz içirildikten sonra ½ ,1 , 2 , 3 , 4 , 5 saatlerde glukoz oksidaz metodu ile kan glukoz tayinleri yapıldı.

OGTT sonuçları ve olguların semptomları incelendiğinde 20 olgudan 7 sinin normal , bir olgunun açlık hipoglisemisi, 12 olgunun reaktif hipoglisemisi gösterdiği saptandı.

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Bu çalışmamızda reaktif hipoglisemi insidansının yüksek bulunması nedeniyle olgu adedinin arttırılması ve OGTT sonuçlarına göre hipoglisemi teşhisi koyarken dikkatli davranılması gerektiği sonucuna varıldı.

OGTT sonuçları yaşa göre incelendiğinde hipoglisemi durumunun yaşla ilgili olarak ortaya çıkr· lığı, ayrıca ileri yaşta ailede diabet olan kişilerde hipoglisemi durumunun ortaya çıkışının yaşla ılgılı olmadığı görüldü. 15-25 yaş grubunda % 54 , 26 - 45 yaş grubunda ise % 78 hipoglisemi durumu tesbıt edildi.

20 olgunun 9' unda açlıkta serum kreatin kinaz aktivitesine bakıldı. Glukoz konsantrasyonu   ve kreatin kinaz aktivitesi arasında bir korelasyon olmadığı görüldü.

İstanbul Diabet Cemiyetinden alınan ve normal açlık kan şekeri olan 104 olgunun yaş gruplarına ve ailevi DM olup olmamalarına göre yapılan OGTT sonuçları taramasında anlamlı bir farklılık görülmedi.

INTRODUCTION

In the literature hypoglycemic condition is defined as decrease of blood sugar below certain level after high dosage of insulin administration firstly in 1923 by Campell and Fletcher(1). Gibson and Larimer has explained that clinical hypoglycemic condition could occur without giving insulin externally (2). Wilder and co-workers who when removed island cell tumours from one patient, explained anatomic mean of hyperinsulinism firstly and observed excessive amount of insulin in tumour tissue(3).

Serum insulin is measured more sensitively since Yalow and Berson has performed radioimmuneassey in 1959(4).

According to our literature knowledge at one night hunger stuation , decrease of blood glucose level below 50mg /dl in man or below 40 mg /dl in woman , in plasma below 58mg /dl in man or below 46mg /dl in woman is defined as hypoglycemia.

Presence of hypoglycemia at an earlier age could be a risk factor in development of diabetes mellitus (DM)(6). Hypoglycemia could be reactive hypoglycemia or fasting hypoglycemia (idiopathic). Reactive hypoglycemia could be classified as alimantery hypoglycemia and hypoglycemia due to early DM. Detection and characterization of hypoglycemia in an earlier age is important to take precautions for the development of DM (7). Therefor , in this work 5 hours oral glucose tolerance tests (OGTT) wer e performed on randomly selected subjects with normal fasting glucose levels to determine the hypoglycemia incidences. Also 3 hours OGTT results were analized in different age group in a larger population.

MATERIALS AND METHODS

Five hour OGTT were performed on 20 subjects which were randomly selected from the staff and students with normal fasting glucose levels. After an overnight starvation and after 1/2, 1, 2, 3, 4, 5 hours from the administration of 100mg glucose levels were determined glucose/dl, the capillary blood with glucose oxidase method using Boehringer peridocrom glucose GOP-PAP kits (normal values were 70-100 mg/dl).

The charaıterization of the type of hypoglycemia was done on the OGGT profile according to the description of (fig1).

Serum creatine kinase activities were determined in 9 cases with Boehringer Maanheim, CK-NAC activitated mono test kits and correlation with fasting glucose levels in the subjects were performed with correlation analysis.

A survey of 3 hour OGTT results was done on the 104 cases with different ages obtained from Istanbul Diabetic society having normal fasting blood glucose levels.

The answers in the questinare shown below gave additional information on symptoms of prediabetic cases (Table 1)

Alimentary hypoglycemia   Idiopathic hypoglycemia   Hypoglycemia due to early diabetes mellitus
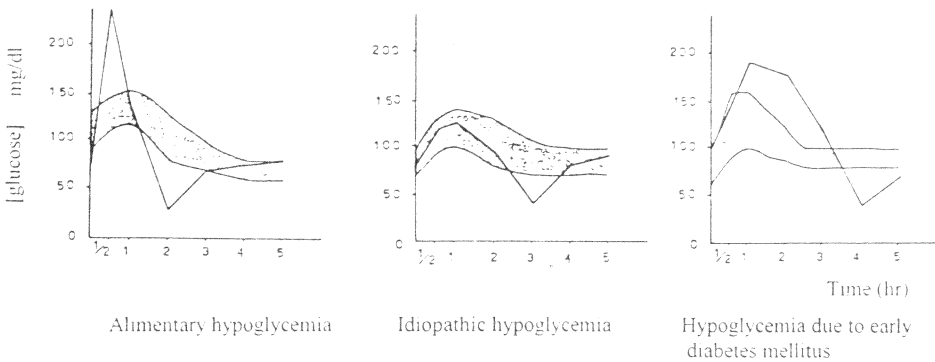
Fig 1: The characterization of hypoglycemia types according to smith the shaded areas are the profiles obtained from normal subjects.

TABLE 1: 3 hour OGTT results of 104 subjects divided into different age groups

Age groups	n	Familial DM	0 hr	1/2 hr	1 hr	2 hr	3 hr
15-25	4	-	86 ± 8	132 ± 21	117±9	102±11	86±13
15-25	9	+	84 ± 6	133±10	130±19	97±7	79±6
26-35	17	-	81 ± 16	118±14	116±15	90±9	75±19
26-35	18	+	88 ± 8	119±16	124±26	97±11	80±9
36-50	16	-	86 ± 7	133±14	138± 30	112±23	84±19
36-50	20	+	86 ± 7	130±28	138±26	106±25	83±19
51 <	10	-	88 ± 11	141±19	155±34	143±41	106±4
51 <	10	+	87 ± 6	131±21	141±24	110±23	77±7
Mean	104	-, +	86 ± 7	130±18	132±10	107±17	84±17

RESULTS AND DISCUSSION

As shown in Table 2 out of 20 cases 5 had positive hypoglycemia symptoms shown in Table 1. The ages varied from 17 to 43 years of age.9 subjects stated at least 11 symptoms related with DM. Only 2 subjects had both hypo- glycemia and familial DM.

The OGTT profiles of each of 20 subjects are shown in fig 2. Each subject was analyzed according the profiles in fig 1, the subjets of No.s 7,6,13,16 were classified as early DM. No.1 case had instant increases of postprandial glucose levels and fall of glucose levels under fasting level (24%), in the 4th hr. of OGTT and she had relatives with DM. Subjects No.s of 2,4 and 5 were calassified as normals. No.s 3,12,14,17 subjects showed alimantery (dietary) hypoglycemia OGTT profiles where as 15 had fasting hypoglycemia. 7 subjects out of 20 had normal profiles, 15 had starvation hypoglycemia, 12 had reactive hypoglycemia with 3 being alimantery hypoglycemia, 5 being idiopathic hypoglycemic and 4 being early DM. 60% of the cases had reactive hypoglycemia. The hypoglycemia incidence had no correlation to age (Fig 3). Due to high insidence of reactive hypoglycemia, to draw a conclusion no of cases should be increased and high precaution must be taken in the diagnosis of hypoglycemia depending on OGTT results. Over 5 hr. OGTT could be recommanded.

TABLE 2: The age, sexs, symptoms with OGTT and creatine kinase results of subjects selected from staff and students with normal fasting glucose levels.

Subject No.	Age	Sex	OGTT (mg/dl)							Creatine kinase U/L
			0 hr.	1/2 hr.	1 hr.	2 hr.	3 hr.	4 hr.	5 hr.	
1 D.B.**	17	K	86	191	137	90	79	62	74	-
2 N.S.	17	K	84	198	127	83	87	91	77	-
3 S.U.	18	K	78	110	126	100	92	70	76	-
4 N.Ö.	17	K	96	170	153	107	141	124	85	-
5 S.A.	17	K	90	178	180	91	112	86	79	-
6 F.B.**	18	K	69	154	148	100	53	71	46	-
7 Ö.Ö.**	18	K	87	111	130	88	79	77	76	32
8 U.T.**	19	K	108	125	78	56	107	72	-	121
9 E.A.	19	K	93	136	125	76	63	82	76	-
10 K.A.	19	E	106	119	97	67	69	71	54	-
11 Ş.B.	22	K	93	98	125	120	67	78	80	-
12 A.K.*	23	K	107	180	138	80	49	54	76	105
13 Y.Y**	28	K	91	130	129	84	85	62	66	89
14 M.Ö*	32	E	85	150	105	72	77	77	61	-
15 S.S.**	35	K	50	78	71	57	68	48	50	80
16 M.K**	35	E	102	159	133	75	57	44	87	48
17 G.K.*	31	K	86	180	79	71	53	50	61	56
18 V.Y.**	36	E	80	140	131	84	70	79	70	64
19 Y.U.*	37	K	87	114	107	80	142	61	51	-
20 T.Y.**	43	K	102	130	157	110	36	80	75	56

*: with hypoglycemia symptoms
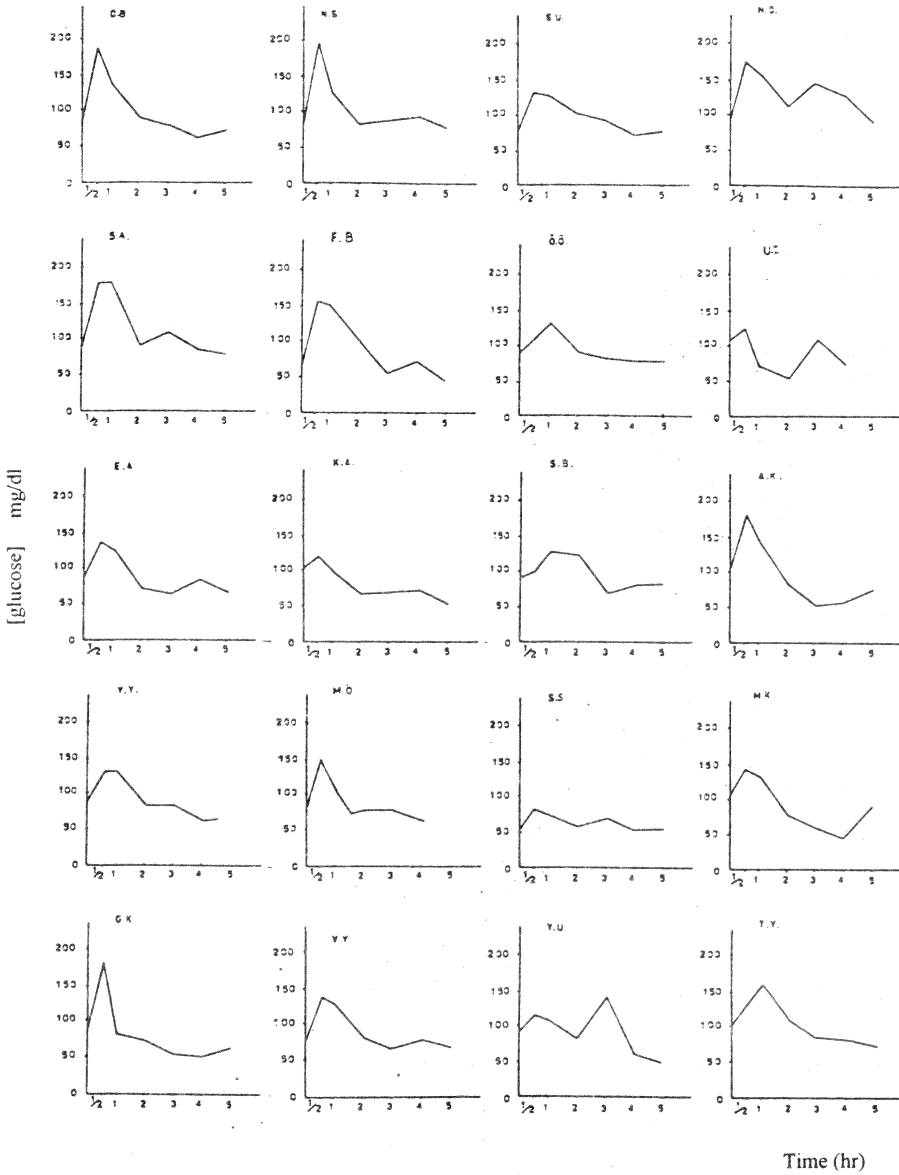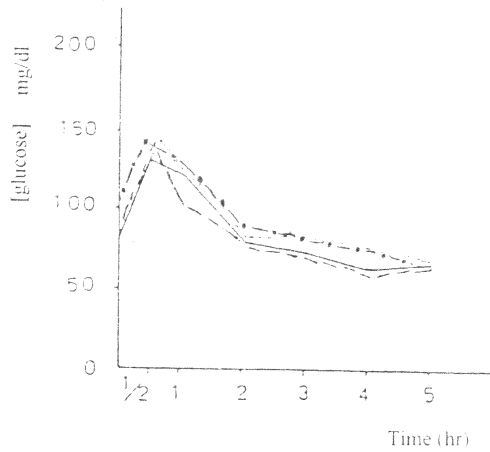**: with DM family members

Fig 2: OGTT profiles of the cases studied.

Fig 3: Mean Values of OGTT results in subjects familial DM (——): Subjects Without familial DM (.......), subjects between 26-45 years of age (-.-.-.-.) and subjects between 26-45 years of age (------).

Creatine kinase activity had no correlation with fasting glucose level (Fig4). As seen in   Table 2 and fig 5 the effect of age and familial DM. On 3 hr. OGTT profiles,no significant OGTT differences were observed between the age groups and between the familial and nonfamilial DM subjects.
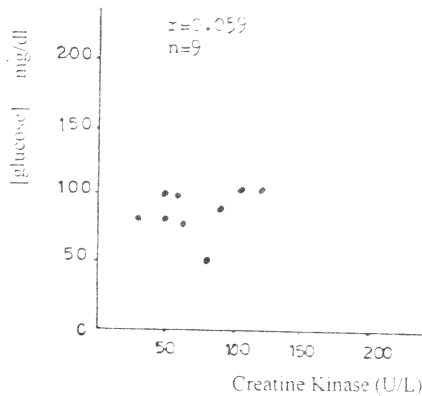

Fig 4: The correlation between serum creatine kinase levels and the blood fasting glucose levels.
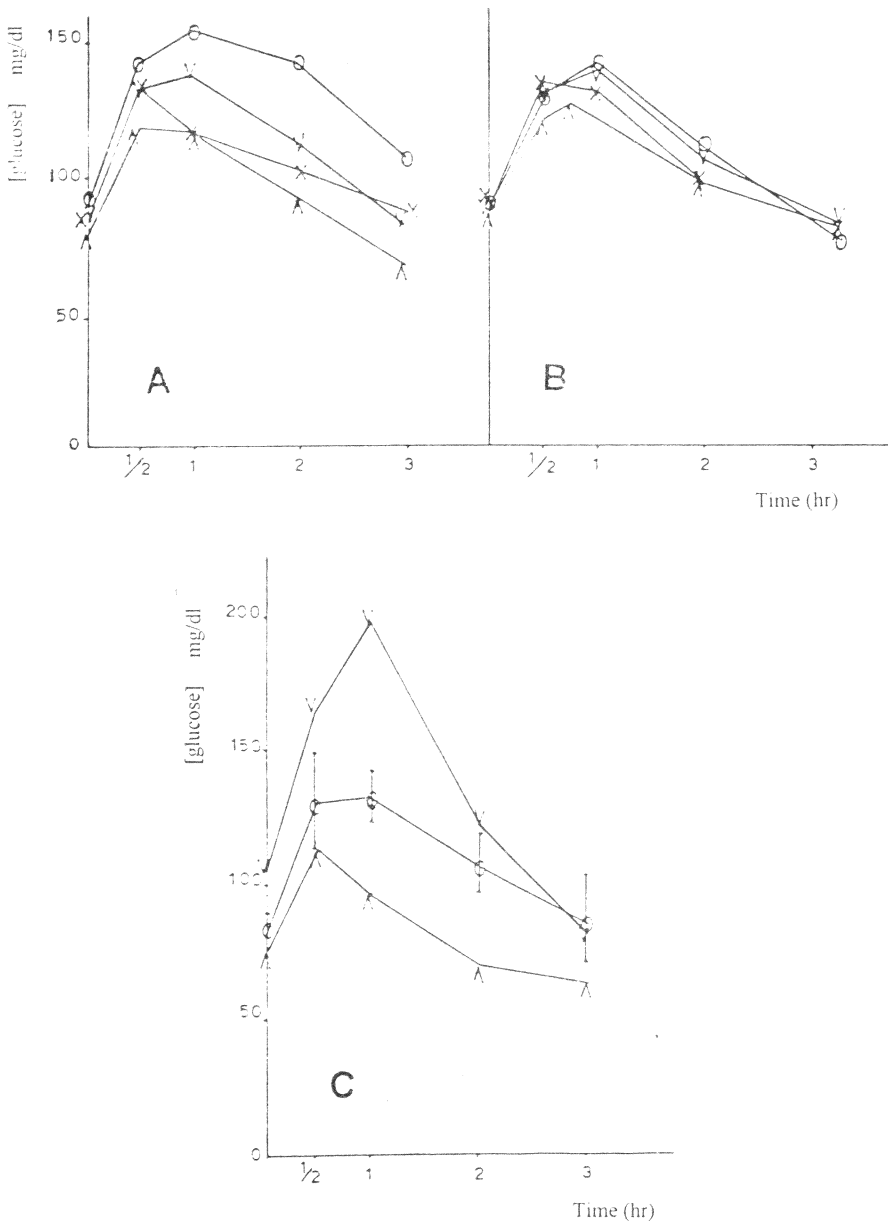
Fig 5: Three hour of OGTT results in cases with familial DM (B) and in cases of nonfamilial DM (A) and indifferent age groups regardless of familial DM (C). X   15-25 years; ^: 26-35 years; V: 36-50 years; 0>51 Years

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