An important method in the early diagnosis of prediabetes in obese children; AMBULATORY GLUCOSE MONITORIZATION

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INTRODUCTION

Childhood obesity (CO) is an important risk factor for the development of many chronic metabolic diseases of the adult age, and one of the most important ones is glucose homeostasis. However, the parameters used to diagnose carbohydrate metabolism disorders in obese children are not always guiding early in detecting pathologies, and may be inadequate to predict the pathologies. . ***For this reason new diagnostic methods are needed.*** For this purpose, in this study it was deemed suitable to investigate the importance of ambulatory glucose monitoring (AGM) in obese children to evaluate metabolic complications of the glucose homeostasis system in early stages.

MATERIALS AND METHODS

After detailed history, anthropometric evaluation and physical examination in nine obese children who applied to our pediatric endocrine polyclinic, biochemical and hormonal panels were searched. First of all, ambulatory glucose monitoring (AGM) was applied to all cases and measurements were taken seven times a day for 14 days. Diet and exercise treatment were not performed during these measurements. Especially we wanted them to go on their daily life and habits during this period.Other conventional diagnostic methods (basal and postprandial blood glucose level, insulin resistance parameters, OGTT HbAlc) were used to determine glucose homeostasis after 14 days of measurement. Measurements were determined as morning hunger, first and second hours after breakfast, before lunch, after 1 and 2 hours after meals, before dinner, 1 and 2 hours after meals, and at 03:00 in the morning. Measurements of blood glucose level below 70 mg / dl were assessed as hypoglycemia, values above 180 mg / dl were assessed as hyperglycemia.

RESULTS

The general characteristics of all cases are shown in Table 1. The AGM data of the cases are given in Table 2. Figures 1 and 2 show the AGM data visually. Although conventional parameters of glucose homeostasis were normal levels fasting glucose intolerance in 21 cases and postprandial glucose intolerance in 3 case were determined during AGM. In the other hand 31 hypoglycemic attacs were recorded during AGM data.

Table 1. Physical examination and glucose metabolism characteristics of obese subjects

Age (years)	12,7 (9,5-15)
BMI kg/height(m2)	29,28 (23,8-35,32)
Fasting blood glucose (mg/dl)	90,5 (81-98)
Fasting insülin (IU/L)	17,6 (8,3-22,2)
HbA1c	5,3 (4,7-5,6)
IR-HOMA	3,91 (1,7-5,5)
HOMA BETA CELL	232,9 (151,8-296)
OGTT 120.minute blood glucose	121,2 (95-138)
OGTT 120.minute İnsulin	81,44 (30,1-116,8)

Tablo 2.The AGM data of all cases

	case 1	case 2	case 3	case 4	case5	case 6	case 7	case 8	case 9
Morning Hunger	86,8(74-102)	92,5(83-131)	96(84-104	94 (79-111)	80,6(64-91)	70(62-74)	80(64-94)	89,5(83-97)	90,5(83-96)
Morning 1. hour	91,7(68-120)	125,6(104-155)	104,5(73-135)	99,1(87-120)	88,6(78-98)	72(60-82)	86,1(76-97)	122,2 (104-158)	127,6(104-159)
Morning 2.hour	80,5(71-98)	102,8(83-120)	89,1(71-110)	93,5(84-112)	89,2(78-100)	70,5(64-77)	83,3(64-90)	101,8(83-120)	104,8(83-120)
Noon hunger	89,8(69-100)	93,4(78-127)	82,5(72-102)	85,6(69-103)	79,6(62-103)	70.7(62-89)	87(64-103)	97,4(78-101)	92,5(78-95)
Lunch 1.hour	100,5(86-121)	133,2(117-185)	110,5(93-129)	102(74-125)	95,3(73-122)	95,9(73-120)	111,6(79-137)	116,2(116-185)	127,2(109-185)
Lunch 2.hour	**96,3(86-102)**	126 (86-144)	**101,4 (86-119)**	**96(75-132)**	87,3(76-106)	**82(64-123)**	102(82-136)	127(86-146)	130(86-151)
Evening Hunger	95,1(80-112)	101,6(63-150)	93,8(78-110)	94,9(84-112)	90,3(74-110)	77,1(65-95)	90,5(69-135)	102,6(63-150)	103,6(63-150)
Dinner 1. hour	106,5(80-128)	114,4(78-143)	97,6(91-103)	101,6(88-112)	93(72-123)	84,3(75-95)	112,4 (77-138)	109 (78-143)	111,4(78-143)
Dinner 2. hour	105,5 (78-125)	105,5 (80-113)	95,4 (78-108)	96,1 (84-119)	85,7 (62-101)	88,4 (64-116)	104,7 (66-130)	105,5 (80-113)	105,5 (80-113)
At 03:00	89,6(60-113)	91,1(89-94)	92,1(87-103)	94,2(82-112)	80(61-106)	69,8(63-79)	81,2(65-92)	91,1(89-94)	89,1(89-93)
Hypoglycemia	1	1	0	1	6	14	6	1	1

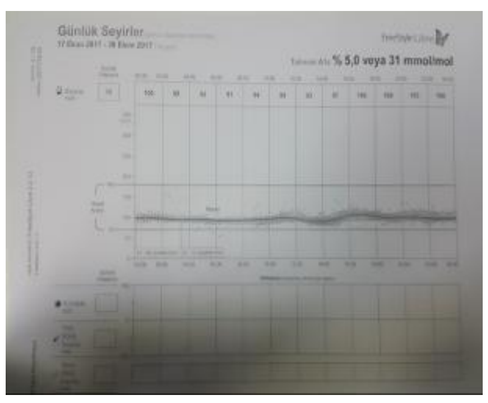
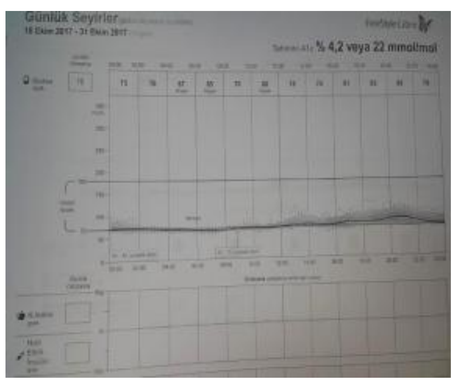


Figure1 -2: Monitoring of glucose fluctuations in AGM data



REVIEWS

As a result; fasting blood glucose, basal and OGTT glucose, insulin, HbA1c levels and HOMA IR index in obese subjects may not always provide healthy information. Particularly, hypoglycemia will affect all basal values, especially HbA1c. *Ambulatory glucose monitoring is highly valuable in this group of patients in terms of ensuring a long follow-up of fourteen days in obese cases with this study protocol, assessment of blood glucose fluctuations (hypoglycemia-hyperglycaemia) and individual regulation of feeding through demonstration of relationships with nutrition. Another important point, this study may guide physicians to determine if medical treatment is necessary for the cases.*