DİABETES MELLİTUS

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BY DİABETES PREVENTİON METHODS

PREVALENCE

The prevalence of type I diabetes in white race %0.05, % 0- 1.8 in African Americans. According to WHO and İDF (international diabetes federation), 4.9 millions of people have DM type I and prevalence is %0.09 all through the world regarding all the nations and societies.

Type II diabet prevalence in 2003(ages between 20-79) is %5.1, IGT (Impaired glucose tolerance) is %8.2

FACTORS AFFECTİNG TYPE I DM İNCİDANCE

AGES : Rises at preschool and puberty period.Mean icrease per year is around %3.

Gender: Type I Dmis more frequent in males.

Ethnic origin: DM incidance changes according to races.

For example in white races in pensilvania, USA, DM type I incidance is 18.1/100 000children/year, while 10.2/100 000 children /year in african americans.

Seasonalonset:Type I DM is seen more in winter

Mother age: Type I DM risk ,s 3 times more in children whose mothers have given birth over 40 years old.

Familial DM : Although type DM has genetic disposition only %12 of type I DM cases are familial.

İf the father has type I DM, diabet risk is %6, if the mother has it, the risk is % 2, both the father and the mother have it the risk is %30, if the monozygot twin has it the risk is %30.

Environmental factors: Even the main determinator of type IDM risk is genetic predisposition, multiple environmental factors play a role in the onset of the disease.

Viral infections: Mumps, coxaki B3 qnd B4 viroses infect human pancreas in vitro, and lead to B cell destruction.The people who have congenital rubella infection , have high risk of DM type I.

Breast feeding and cow milk: The people who have been breastfed for a long time, have a less Dm type I risk. The children who have been breastfed less than 3 months and started cow milk early have 1.5 time more DM risk.

Type II DM risk factors:

Factors that can be modified: Obesity, lack of physical activity, smoking, nutrition style with saturated lipids are the factors that increase DM and possible to be changed.

Factors that cannot be modified: aging, gender, genetic predisposition, family history of DM, low birth weight.

Aging: Regarding the development of medical science in the last century, chronic diseases like DM have increased as a result of the extension of human life.

Obesity: Type II DM risk is highly relevant to abdominal obesity in which excesive weight is accumulated on the upper torse.

Life style: Lack of physical activity, irregular and high calorie diet increases the risk of type II DM.

- İf person has got familial risk The risk of DM is so high.
- İf father or mother has got DM, the risk of DM is % 8-14.
- İf both mother and father have got DM, the risk of DM is % 25-40.
- İf the twin sister has got DM, the risk of Dm is % 50-75

DM SINIFLAMASI

1- Tip I DM

2- Tip II DM

3- gestational diabetes mellitus

4- Other specific types of diabetes.

genetik defect on B ceel fonction

İnsülin etkisindeki genetik defects on the affact of insülin

Pankreas ekzokrin tissue disease

Endokrinopatiler

drug orchemical ajanlar

İmmün aracılı nadir diabet formları

Diabet ilişkili genetik sendromlar (Down sendromu, klinefelter, turner sendromu etc

DIAGNOSTIC CRITERIA
Manifest diabetes mellitus

-Random glucose greater than 200
-Fasting blood glucose greater than 126
the 2-hour OGTT Over 200
-HgA1c greater than 6.5 (48 mmol / mol)

Impaired Glucose Tolerance

OGTT in the 2. hour is between 140-199

Impaired fasting glucose

Fasting blood glucose between **100-125**

and

OGTT 2. hour blood glucose **under 140**

(according to the WHO 110-125)

Gestational diabetes

In order to investigate gestational diabetes, many communities usually use 50 gr glucose test.

İf 50 gr glucose test psitive, several days later 100 gr glucose test should do.

ADA criteria in gestational diabetes

	fasting	1. hour	2.hour	3.hour
100 gr glucose test	≥95	≥180	≥ 155	≥ 140

At least 2 abnormal value provide a diagnosis

(ADA= American diabetes association)

DM SYMPTOMS

Classic symptoms

polyuria,
polydipsia,
Polyphagia, or loss of appetite,
Dry mouth,
nocturia,

Less common symptoms;

Blurred vision,
Unexplained weight loss
Persistent infections,
Recurrent yeast infections

STANDARD MAINTENANCE PRINCIPLES AND FOLLOW-UP

Medical History:

Symptoms of diabetes,

Diet program compliance,

Exercise program compliance

Monitoring of glucose and hemoglobin A1c values in the previous review,

Drugs used for Diabetes mellitus in harmony,

Smoking, alcohol or drug use questioned

other than the drugs DM should be evaluated

Questioned the findings of chronic complications

PHYSICAL EXAMINATION

Height and weight measurements,
Waist circumference,
Blood pressure measurement,
Fundus examination,
Intra-oral examination,
Thyroid examination
Cardiac examination,
Abdominal examination,
Hand finger examination,
Foot examination
Skin examination,
neurological examination

LABORATORY STUDIES

Blood glucose monitoring
HbA1c .....once a 3 months
Fasting lipid profile ..... Once a year,
Microalbuminuria ..... 5 years after the diagnosis of Type I DM, and every year after diagnosis of type II DM in
Creatinine every year ...
TSH
Urine analysis every visit .....
ECG years

Microalbuminüri

albumin in Total urine İn 24 hour

Normal albuminüri	≤ 30
Micro albuminüri	30-300
Macro albuminüri	300 ≤

GLYCEMİC TARGET

	İdeal	target	in pregnency
HbA1c	≤6	≤6.5	≤6.5
Fasting blood glucose	70-100	70-120	60-90
Postprandial blood glucose 1.hour	≤130	-	≤120
postprandial blood glucose 2.hour	≤120	≤140	≤120

other age groups glicenic control
Children 0-6 years of age
Fasting blood glucose of 100-180,
night blood sugar 110-200.
HbA1c 7.5-8.5
Between the ages of 8-12

90-180 fasting blood glucose,
night 100-180,
HBA1c ≤ 8
People over the age of 65, a 10-year life expectancy is low and strict metabolic control of patients with concomitant illness is not recommended.

Diabetes mellitus and Hypertension

Target ≤130/80

The preferred drugs

-ACE –I(Angiotensinojen convertıon enzym inh)

-ARB (Angıotensiojen reseptor blocers)

-B blocers

-Diüretics

Relationship between HbA1c and glucose

HbA1c		mean blood glucose
5	……	100
6	……	135
7	……..	170
8	…….	205
9	……	240
10	…….	275
11	……	310
12	…….	345

DCCT

HbA1c‘yi %1 reduced efects on the risk of cronic complicatıon

Tip I DM (DCCT)	Tip II DM (UKPDS)
The risk of retinopaty %35	die due to DM %25
Nefropathy % 24-44	myocardial infarction % 18
Neuropaty %30	Microvasküler complication % 35

DİABET AND DİET THERAPY

- Diet therapy is very important in Diabet.

- An effective diet therapy reduces HbA1c about % 1-2

-İntake calories will be % 30-35 oil, % 15-20 protein, % 45-50 karbonhidrat

-Normal adult should intake about 2400-2500 calories. Those who do heavy work sholud intake 3000-4000 calories.

The basic elements of diet therapy:

- Patient's weight should be set so that the calories.
- Simple sugars (monosaccharides) is prohibited.
- Vitamins and minerals should be enough.
- Dietary fiber should be sufficient.
- Diet meal should be arranged 6-7times a day.

Forbidden foods:

- Sugar and sweets.
- Cake, cookies, food like.
- Alcoholic beverages, soft drinks.
- Prepared foods.
- Sausage, bacon, salami, such as foods, cream and sauces.
- Fried in oil.
- Nuts.

CALCULATION OF CALORIES

Yogurt (full fat) 200g |	140
Yogurt (low-fat) 250g |	113
Yogurt (light-skimmed) 250g	8
Buttermilk (1 box cup)	93
Lor-(fat-free, salt-free) 100g |	85
Cheddar cheese (1 matchbox)	121
Fresh yellow (1 matchbox)	102
Feta cheese (Edirne) (1 matchbox)	71
Karper cheese (triangle)	1 65
Karper cheese (light)	1 50
Labne cheese (1 matchbox)	62
Milk (long life-full-fat) 1 cup (240ml)	146

2 slices of bacon Sliced Beef-	122
2 slices of sliced turkey-bacon-	124
Ham 100g |	182
Hungarian salami-60g |	13
Light Salam 60g |	96
Turkey Salami 60g |	132
Sausage-Long-60g (1)	147
Sausages 60g |	189
Chicken (skinless) 100g |	190
Turkey (without the skin) 100g |	150
Veal (low-fat) 100g |	156
Veal (moderate fat) 100g |	190
Beef (low fat) 100g |	225
Beef (medium fat) 100g |	263
Sheep Meat 100g |	263
Trout 100g |	168
Shield 100g |	193
Bonito 100g |	168
Mackerel 100g |	159
100g mussels |	95
Shrimp 100g |	91
Lobster 100g |	91

Rye Bread 1 slice	61
Whole Wheat Bread 1dilim	53
1 slice of white bread	68
Pita-Oven 1-200g |	586
Pita-Restaurant-1pcs-120g |	345
Corn Flakes 100g |	386
Pasta (raw) 100g |	369
100g macaroni-fiber diet piyale |	348
Piyale whole wheat pasta-100g |	321
Popcorn-Plain 100g |	386
Popcorn-Oil-100g |	486
Rice (raw) 100g |	363
Bulgur (raw) 100g |	357

entils (raw) 100g |	340
Chickpea (raw) 100g |	360
Dry Beans (raw) 100g	340
Broad beans (raw) 100g |	338
Pinto beans (raw) 100g |	349
Soybean (raw) 100g |	403

Cut two pieces of sugar-10g |	39
1 serving of rice pudding	334
Homemade baklava-30g |	112
Sesame Oil 1 tbsp = 10g |	52
5-6 Simple Delight-	102
Chocolate 100g |	528
Ice Cream-Milk 100g |	193

Hamburger 1	260
Double Hamburger 1pcs	560
Pizza 1 small	620
1 serving of Meat Lasagna	370
1 serving of plain cooked ravioli-	412
Psyllium 1	270
Baked Macaroni 1 slice	505
Tray 1 slice of pie	421
Minced meat. Pepper 1 serving	226
1 serving of Stuffed Zucchini	247
Tas Kebab 1 serving	348
Roast Meat (pat.haş.) 1porsiyon	311
1 serving of pasta sauce,	337
Plateau Soup 1 serving	115
Lentil Soup 1 serving	183

DİABETES MELLİTUS AND EXERCISE

-Exercise is recommended that all diabetic patients

- Exercise facilitates weight loss.

-Exercise facilitates improve insulin resistance

-the increase in body temperature and activity enhances the effects of insulin.

- The Hypoglicemic risk increases during exercise. Be careful

- person who has got prediabet and diabet should do exerxise 150 minutes / a week

- Heart rate should be % 60-80 of maximum heart rate

(Maksimum kalp hızı=220-yaş)

TREATMENT OF DIABETES MELLITUS

1-Diet
2-Exercise
3-Oral antidiabetic drugs
4 -Insulin therapy

Oral anti diabetic drugs

insulin secretagogue

1- Sulfonilüre group

	daily dose	the time of receipt
-Glipizid	2.5-40 mg	1-3 times/a day
-Glipizid retar formu	5-20 mg	1once a day
-Gliclazide	80-240 mg	1-3 times/a day
-Gliclazide retard formu	30-90 mg	once a day
-Glibenclamide	1.25-20 mg	1-2 times a day
-glimepride	1-8 mg	once a day

2- Glinid group

	daily dose	the time of receipt
Repaglinid	0.5-16 mg	1-4 times /a day
Nateglinid	60-360 mg	1-3 times /a day

3-insulin-sensitizing drugs

1-Biguanidler

Metformin	500-2550mg	1-2 times a day

2-Glitazonlar(Tiazolidinedionlar)

Rosiglitazon	2-8 mg	1-2 times a day
pioglitazon	15-45 mg	once a day

4- Alpha-glucosidase inhibitors

Acarbose

Miglitol

5-İnsülinomimetics

Amilin analogs

-Pramlintid

İnkreatin mimetics

- eksenatin,

-Sitagliptin,

-Vildagliptin

Side effects

Sulfonilüre groups

Hipoglisemi,allerji,hepatotoksisite

Metformin

gastrointestinal irritation, diarrhea, metallic taste in the mouth, lactic acidosis

glitazon

Edema, anemia, congestive heart failure, waight gain

INDICATIONS FOR INSULIN

-Type I DM
- Hyperglycemic emergencies
-Some of the typical DM
-Gestational DM

TYPES OF İNSULİN

Regüler (shorttr acting))

Regüler insülin ..Humulin R, ActrapidHM

Fast acting ……..İnsülin lispro (Humolog)

İnsülin aspart(Novarapid)

İnsülin glulisin(apidra)

İntermediate acting

NPH (Humulin N, İnsulatard, Lente)

long acting

İnsülin glargine (lantus)

İnsülin determine

Mix insülin Humulin M, Mixtard HM, Novomix, Humolog Mix 25, 50

INSULİN DOSE ADJUSTMENT

normal weight	0.3-0.4 u/kg/day
obese	0.5-0.8 u/kg/day
new onset Type I DM	0.3 u /kg/day

Acute complications of diabetes mellitus

Diabetic ketoasidosis

Diagnosis of diabetic ketoasidosis

-Blood glucose ≥ 300

-Ketonemia

-Acidosis (pH ≤ 7.30)

- bicarbonate ≤ 15

- GAP-anionic ≥ 12

treatment of diabetic ketoacidosis

- İntravenöz saline (%0.9 Nacl)
- İnsülin infüzyonu
-K
- antibiotic , If patient has got infection
- bicarbonate ($NaHCO_3$) pH ≤ 7.0

Non ketotic hyperosmolar coma

Diagnosis

- plasma or urine ketone bud negative

-Plazma glukoz ≥ 600

-Osmolarite ≥ 320

- Hipernatremia

- severe dehydration

- Prerenal azotemia

treatment of Non ketotic hyperosmolar coma

- ozmolarite ≥320 %0.45Nacl
- ozmolarite ≤320 %09 Nacl
- central venous catheter insertion
- Correction of electrolyte imbalance
- insulin infusion as diabetic asidosis.

If brain edema, Mannitol, %3 Nacl

- serum osmolarity calculate: 2x(NA+K)+Glucose/18+BUN/2.8

HYPOGLYCAEMIA

Hypoglycaemia is the most important comlication of the insulin therapy.

Hypoglycemia is more urgent and more dangerous than hyperglycemia.

If hypoglycemia is not treated as an emergency, Following the development of the death and coma

Signs of hypoglycemia;

-Chills - cold sweats - anxiety, - nausea , -throb, - dizziness,

- headache, -weakness, -confusion, - speech difficulties -consciousness disorder -coma

Symptoms of hypoglycemia should be explained to the patient.Patient should recognize the symptoms of hypoglisemia and be carefuly.

Patient with mild hypoglycemia may be treated by oral food intake.

Moderate and severe hypoglicemia have to treated by introvenous dextroz.

Urgent hypoglycemia treatment;

20-30 cc %20 Dextrose infusion

folowing % 5 or % 10 Dextrose infusion continuous .

Then adjust blood glucose.

given glucagon if you have

The chronic comlications of diabetes mellitus

The macrovascular comlication is coronary artery disease.

The coronary aretry disease is the most important cause of death.

The coronary artery disease should be treated by cardiologist.

The microvascular complications of diabet

-Diabetic retinopathy

-Diabetic nefropathy

-Diabetic Neuropathy

The microvascular comlications of diabetes mellitus should be treated specialist doctor.

The diabetic foot

The diabetic foot is the most boring complication of diabet. It takes a lot of time and money. Treatment does not give the best results every time and you may need amputation.

İf there is infection you should give antibiotic effective aerobic and anaeorob. Following according to the culture result

Diabetic foot ulcer is neuropathic, ischemic, and neuro-ischemic classified as

The most important pathogens in diabetic foot wounds;

-gram-positive cocci for example staf aureus

- b-hemolytic streptococci

- coagulase-negative staphylococci

- anaerobic bacteria for example pseudomonas

Laboratory

- Sedimentation and CRP eleveted
- X-ray useful for osteomyelitis
- Magnetic resonace imaging useful for deep tissue infection, abscess and osteomyelitis.

Diabetic foot treatment

1- Antibiotics İf there is infection you should give antibiotic effective aerobic and anaeorob. Following according to the culture result

2- Wound care ;

You should clean by isotonic Nacl.
You should clean necrotic and infected tissue
Bone with infected and necrotic should be resection

3- revascularization therapy;

4- removal of the press;

beds with resting, total contact cast,scotchcast boots,

New technicals

- vacuum aspiration device
-specific wound dressings
-hyperbaric oxygen

DİABETİK FOOT EXAMINATION

Video 1

Diabetic Foot exam.mp4

Vaccination in diabetic patients

- children with DM… rutin vaccination program
- give flu vaccine to every diabetics.
-pneumococcal vaccine over 65 patient.
-

Diabet and operation