Study of Leptin in Vitreous Fluid in Type 2 Diabetic Patients with Diabetic Retinopathy

Thesis submitted for partial fulfillment for master degree of
Internal Medicine

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List of Abbreviation

AGEs	**advanced glycation end product.**
BMI	**body mass index.**
BP	**blood pressure.**
CNTF	**ciliary neurotrophic factor.**
CRA	**central retinal artery.**
CSME	**clinically significant macular edema.**
DA	**discarea.**
DCCT	**diabetes control and complication trial.**
DM	**diabetes mellitus**
DSP	**distal symmetrical polyneuropathy.**
ESRD	**end stage renal disease.**
GCSF	**granulocyte colony stimulating factor.**
GFR	**glomerular filtration rate.**
HbA1c	**glycosylated hemoglobin.**
HGF	**human growth factor.**
HNF	**hepatocyte nuclear transcription factor**
IDDM	**insulin dependent diabetes mellitus**
IGF	**insulin like growth factor.**
IL	**interleukin.**
IRMA	**intraretinal microanurysm.**
JTK	**janus protein kinase.**
LIF	**leukemia inhibitory factor.**
m RNA	**messenger ribonucleic acid.**
MA	**microanurysm.**
NCV	**nerve conduction velocity.**
NGF	**nerve growth factor.**

NIDDM	**non insulin dependent diabetes mellitus.**
NOD	**non obese diabetic.**
NPDR	**non proliferative diabetic retinopathy.**
NVD	**neovascularization of the disc.**
NVE	**neovascularization elsewhere.**
Ob	**obese.**
PAI	**plasminogen activator inhibitor.**
PDR	**proliferative diabetic retinopathy.**
PEDF	**pigment epithelium-derived growth factor.**
PKC	**protein kinas c**
PR	**proliferative retinopathy.**
PRH	**periretinal hemorrhage.**
RPE	**retinal pigment epithelim**
STAT	**signal transducer activator of transcription.**
TCA	**tricarboxylic acid.**
TGF	**transforming growth factor**
VB	**venous beading.**
VGF	**vascular endothelial growth factor**
VH	**vitreous hemorrhage.**
VPT	**vibration perception threshold.**

Introduction :-

Leptin is a cytokine that regulate energy metabolism and is linked to diabetes mellitus through its metabolic actions. It is angiogenic and promotes wound healing, moreover, leptin is associated with neovascular and fibrotic complications of diabetes and other retinopathies*(Gariano et al., 2000).*

Leptin is considered to play an important role in the regulation of body weight and metabolism. In obese individuals, it is strongly associated with metabolic disorders, hypertension and vascular complication in diabetics(*Asakawa et al.,2001).*

Leptin induces promotion of angiogenesis and neovascularization, so, it plays a role in the progression of human diabetic retinopathy to a proliferative phase(*Uckaya et al.,2000).*

Diabetes mellitus is very common in older persons. Change in the exercise habits, increase in the body weight, leptin, amylin, tumor necrosis factor alpha and nitric oxide, all play a role in the pathogeneses of age related insulin resistance*(Morly,1999).*

Serum leptin level are elevated in type 2 diabetic patients with microalbuminuria and macroalbuminuria, so that, renal leptin degradation is already impaired in the early stages of renal disease*(Fruchwald, 1999).*

Leptin plays a promoting role the angiogenesis. The vascular endothelium expresses the long form of leptin receptor, so leptin might contribute to end organ damage. In hypertension, plasma leptin increase progressively with higher grades of hypertensive retinopathy*(Uckaya et al.,2000)*

Aim of the study

The aim of the study is to measure leptin level in the serum and vitreous fluid by ELIZA in patients with diabetic retinopathy to correlate the figures with the state of diabetic control as evident by fasting blood glucose &HbA1c.
Moreover to investigate the relationship between plasma leptin, vitreous fluid level and the severity of diabetic retinopathy

Subjects and Methods

This study will include 25 patients with type 2 diabetes mellitus from Ain Shams University Hospital which undergoes, vitrectomy operation
Their ages range between 40-80years
They will be further classified into

<u>Group(A): 15</u> patients with proliferative diabetic retinopathy

<u>Group(B)as controls 10</u> apparently healthy individuals free from any systemic disease including diabetes mellitus and hypertension performing vitrectomy operation for other causes like trauma

All subjects of the study were subjected to the following :-

1-History taking with particular stress on the age at onset , duration of diabetes mellitus , symptoms of hyperglycemia and diabetic complications.

2-Thorough clinical examination with particular stress on diabetic complications anthropometric measurement weight, height &body mass index.
Body mass index estimated form the equation:-

3-Laboratory investigation :-
-Fasting blood glucose in mg/dl.
-HbA1c by ion exchange chromatography.
-Vitreous fluid leptin level in ng/ml byELIZA .
-Serum leptin level in ng/ml by ELIZA.

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الليبتن هو سائل خلوي يدخل في تنظيم الطاقة و هو مرتبط بداء البول السكري من خلال تأثيرة علي عملية الأيض. و الليبتن مادة تساعد على التخليق و تساعد علي ألتام الجروح و هو مصاحب لمضاعفات مرض السكر التليفية الخاصة بتخليق أوعية دموية جديدة و أيضا فى مرضى الشبكية. و يلعب الليبتن دورا هاما فى عملية تنظيم وزن الجسم و الأيض للدين يعانون من زيادة وزن الجسم
كذلك فأن الليبتن مرتبط بقوة فى بحالات أرتفاع ضغط الدم و مضاعفات مرض السكر الخاصة بالأوعية الدموية و يدخل الليبتن فى عملية التخليق و عملية تخليق أوعية دموية لدلك فهو مرتبط بتقدم مرض الشبكية إلى النوع المتشعب.
مرض البول السكرى شائع فى كبار السن. إن التغيير فى العادات و مستوى الليبتن فىالدم و الأميلين و معامل الورم ألفا وحامض النيتريك كل دلك يلعب دورا فى حالات مقاومة الأنسولين فى حالات كبار السن.
يرتفع مستوى الليبتن فى الدم فى النوع الثاني من مرض السكر و المصاحب لتأثيرات على الكلى و تاثير دلك على عملية تكسير الليبتن فى الكلى

الهدف من الدراسة

الهدف من الدراسة هو قياس مستوى الليبتن في الدم و مستواة فى السائل الزجاجى عن طريق قياسة ب اليزا فى حالات مضاعفات مرض السكر على الشبكية و مقارنتة بحالات السكر المنتظم عن طريق عمل
- **سكر صائم**
- **هيموجلوبين A1c**

طرق الدراسة

سوف تتضمن الدراسة 25 مريض من مستشفى عين شمس تتراوح أعمارهم من 40-80سنة و قد قسمت كالأتى:
- **المجموعة الاولى : 15 مريض يعانون من النوع المتشعب من مرض الشبكية**
- **المجموعة الثانية : 10 اشخاص خالين من اى امراض خاصة بالسكر او الضغط اجروا عملية استئصال السائل الزجاجى .**

وستخضع جميع الحالات للاتى:
1. **التاريخ المرضى و الفحص الاكلينيكى**
2. **المختبرات و الفحوصات المعملية.**
   - **سكر صائم**
   - **هيموجلوبين A1c**
   - **مستوى الليبتين فى الدم**
   - **مستوى الليبتين فى السائل الزجاجى**

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