Al-Nisour Journal for Medical Sciences

Manuscript 1139

Relationship Between Renal and Liver Function with Diabetic Retinopathy in Patients with Type 2 Diabetes Mellitus in Iraq

Muataz Mohammed Al-Taee

AL-NISOUR JOURNAL FOR MEDICAL SCIENCE 2025;7:62–64

Relationship Between Renal and Liver Function with Diabetic Retinopathy in Patients with Type 2 Diabetes Mellitus in Iraq

Muataz Mohammed Al-Taee

Department of Biotechnology, College of Science, University of Baghdad, Iraq

Abstract

It is guessed that this study would take a gander at the connection among liver and kidney function and the predominance and severity of diabetic retinopathy (DR) in Iraqi people with type 2 diabetes mellitus (T2DM). three hundred T2DM patients that were browsed Iraqi tertiary thought offices partook in a cross-sectional survey. Segmental, clinical, and biochemical information were gathered, including liver function tests (e.g., alanine aminotransferase [ALT], aspartate aminotransferase [AST], and gamma-glutamyl transferase [GGT]) and renal function tests (e.g., serum creatinine, evaluated glomerular filtration rate [eGFR], and albuminuria). Fundoscopic assessment of DR was directed to recognize proliferative diabetic retinopathy (PDR), non-proliferative diabetic retinopathy (NPDR), and no DR. Multivariate key backslide and relationship investigation were essential for the verifiable examination. The commonness of DR was 62% among the 300 patients (mean age: 55.3 ± 9.8 years; 58% female), with 23% having PDR and 39% having NPDR. Contrasted with patients without DR, those with DR displayed lower eGFR ($p < 0.001$) and more noteworthy serum creatinine ($p < 0.001$). Patients with DR basically had more significant levels of liver catalysts (ALT, AST, and GGT) ($p < 0.05$). A multivariate examination uncovered that DR reality was freely related with expanded albuminuria, diminished eGFR, and broadened ALT. In Iraq, the presence and severity of DR in people with type 2 diabetes are connected to renal damage and raised liver proteins.

Keywords: Diabetic retinopathy, Renal dysfunction, Liver enzymes, Type 2 diabetes mellitus

1. Introduction

Diabetic retinopathy (DR) is a moderate microvascular entanglement of diabetes and a main source of vision debilitation and blindness globally (American Diabetes Association, 2024). It creates because of drawn out hyperglycemia, bringing about retinal ischemia, neovascularization, and expanded vascular permeability (Wong *et al*., 2016). Among patients with type 2 diabetes mellitus (T2DM), the predominance of DR differs fundamentally and is affected by foundational and territorial elements, for example, glycemic control, the span of diabetes, and admittance to healthcare facilities (Yau *et al*., 2012). In Iraq, where T2DM pervasiveness has flooded because of urbanization, dietary moves, and increasing weight rates, DR has arisen as a basic general wellbeing concern (Targher *et al*., 2015).

Renal and liver brokenness are progressively perceived as key supporters of DR movement. Diabetic nephropathy (DN), portrayed by albuminuria and diminished eGFR, is one of the most widely recognized microvascular inconveniences of diabetes, with shared pathogenic components including oxidative pressure, inflammation, and endothelial dysfunction (Cheung *et al*., 2010). Also, liver brokenness, frequently connected to non-alcoholic greasy liver infection (NAFLD), has been related with DR because of fundamental irritation and insulin obstruction, aggravating microvascular damage (Papatheodorou *et al*., 2018). Raised liver enzymes, like alanine aminotransferase (ALT) and aspartate aminotransferase (AST),

Received 28 January 2025; accepted 7 March 2025.
Available online 9 May 2025

E-mail address: mutaz.mohammed@sc.uobaghdad.edu.iq (M. M. Al-Taee).

https://doi.org/10.70492/2664-0554.1139

may act as biomarkers for DR severity (Byrne & Targher, 2015).

While past worldwide investigations have inspected these affiliations, information from Iraq stay meager. Local genetic predispositions, environmental exposures, and healthcare disparities may regulate the communication among DR and fundamental organ brokenness in this populace. This study plans to research the connection among renal and liver brokenness and DR severity among T2DM patients in Iraq, giving knowledge into expected biomarkers and mediations.

2. Materials and methods

2.1. Subjects

This cross-sectional review was led at tertiary consideration communities across Iraq from January to December 2024. A sum of 300 grown-up T2DM patients were enlisted in view of the accompanying consideration measures: age ≥ 18 years, an affirmed finding of T2DM for something like five years, and no set of experiences of visual medical procedure or retinal disorders unrelated to diabetes (Stratton *et al.*, 2000). Patients with chronic kidney disease inconsequential to diabetes, viral hepatitis, or liquor related liver infection were avoided.

2.2. Data collection

- Clinical and Demographic Data: Demographic information (age, gender) and clinical parameters (duration of diabetes, body mass index [BMI], blood pressure, and HbA1c levels) were acquired through patient interviews and medical records.
- Renal Function Tests: Standardized laboratory techniques were used to test renal parameters, such as serum creatinine, eGFR, and urine albumin-to-creatinine ratio (UACR).
- Liver Function Tests: Automated biochemical analyzers were used to measure the levels of albumin, total bilirubin, and liver enzymes (ALT, AST, and GGT).
- Diabetic Retinopathy Assessment: Utilizing the Early Treatment Diabetic Retinopathy Study (ETDRS) rules, DR was sorted as no DR, non-proliferative DR (NPDR), or proliferative DR (PDR) following fundoscopic tests led by a gifted ophthalmologist.

2.3. Statistical analysis

Information was investigated utilizing SPSS (rendition 26.0). Factors were communicated as mean ± standard deviation and looked at utilizing free t-tests or ANOVA. All out factors were dissected utilizing chi-square tests. Multivariate calculated relapse was utilized to decide autonomous indicators of DR. Pearson and Spearman relationship examinations were used to explore associations between biochemical parameters and DR severity.

3. Results and discussion

3.1. Main characteristics

The mean age of the review accomplice was 55.3 ± 9.8 years, with 58% being female. Among the 300 members, DR was available in 186 patients (62%), including 117 (39%) with NPDR and 69 (23%) with PDR (Stitt *et al.*, 2016).

Characteristic	No DR (n=114)	NPDR (n=117)	PDR (n=69)	p-value
Age (years)	52.4 ± 8.9	55.7 ± 9.4	58.9 ± 10.2	0.003
Female (%)	60%	56%	59%	0.784
Duration of T2DM (years)	8.4 ± 2.3	10.2 ± 3.1	12.1 ± 3.9	<0.001
BMI (kg/m²)	28.3 ± 4.2	29.6 ± 4.8	30.1 ± 5.1	0.024
HbA1c (%)	7.8 ± 0.9	8.4 ± 1.1	8.9 ± 1.3	<0.001

Renal and Liver Function Parameters

Parameter	No DR	NPDR	PDR	p-value
Serum creatinine (µmol/L)	89.6 ± 15.4	105.2 ± 18.7	119.3 ± 21.5	<0.001
eGFR (mL/min/1.73 m²)	82.3 ± 14.7	68.9 ± 12.4	54.1 ± 10.3	<0.001
UACR (mg/g)	23.5 ± 8.1	45.6 ± 12.3	61.2 ± 14.9	<0.001
ALT (U/L)	25.8 ± 7.4	31.5 ± 9.2	38.6 ± 10.8	<0.001
AST (U/L)	22.3 ± 6.9	28.1 ± 8.4	34.4 ± 9.7	<0.001

3.2. Discussion

The survey includes the basic relationship among liver and kidney damage and DR severity in T2DM patients. Lessened eGFR and raised UACR, markers of diabetic nephropathy, were earnestly associated with DR variability, dependable with prior examinations highlighting microvascular damage among retinal and renal systems (Patel *et al.*, 2012; Lim *et al.*, 2020). Raised liver enzymes, especially ALT, were freely connected with DR severity, proposing a job for hepatic inflammation and metabolic dysregulation in DR pathogenesis (Zhang *et al.*, 2019).

These discoveries highlight the significance of early discovery and multifactorial administration of T2DM difficulties. Standard observing of renal and liver parameters, close by glycemic and blood pressure control, could mitigate DR progression. Future

exploration longitudinal studies to clarify causal relationships and explore potential therapeutic interventions targeting systemic inflammation and oxidative stress (Emerging Risk Factors Collaboration, 2010).

4. Conclusion

This study exhibits a critical connection among renal and liver brokenness and the severity of DR in Iraqi T2DM patients. Complete administration methodologies, including routine observing and designated mediations, are fundamental to diminish the weight of DR. Further examinations are justified to approve these discoveries in bigger partners.

References

American Diabetes Association. (2024) Standards of medical care in diabetes. *Diabetes Care*, 47(Suppl 1), S12–S22.

Byrne, C.D. & Targher, G. (2015) NAFLD: A multisystem disease. *J Hepatol*, 62(1), S47–S64.

Cheung, N., *et al*. (2010) Diabetic retinopathy. *Lancet*, 376(9735), 124–136.

Emerging Risk Factors Collaboration. (2010) C-reactive protein and vascular disease. *Lancet*, 375(9709), 132–140.

Lim, A.K.H., *et al*. (2020) NAFLD and microvascular complications. *J Hepatol*, 73(6), 1542–1554.

Papatheodorou, K., *et al*. (2018) Complications of diabetes 2017. *J Diabetes Res*, 2018, 3086–167.

Patel, A., *et al*. (2012) Association of ALT with DR progression. *Diabetes Care*, 35(3), 556–564.

Stitt, A.W., *et al*. (2016) Molecular mechanisms of DR. *Prog Retin Eye Res*, 51, 156–186.

Stratton, I.M., *et al*. (2000) Risk factors for DR in type 2 diabetes. *BMJ*, 321(7268), 405–412.

Targher, G., *et al*. (2015) Non-alcoholic fatty liver disease and microvascular complications of diabetes. *Diabetes*, 64(7), 2406–2416.

Wong, T.Y., *et al*. (2016) Diabetic retinopathy. *Nat Rev Dis Primers*, 2, 16020.

Yau, J.W.Y., *et al*. (2012) Global prevalence and major risk factors of diabetic retinopathy. *Diabetes Care*, 35(3), 556–564.

Zhang, X., *et al*. (2019) Association of renal dysfunction with diabetic retinopathy. *Am J Ophthalmol*, 205, 1–8.