



Observational Study Of The Relation Between Hypertension And Diabetic Nephropathy

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ABSTRACT:

Hypertension is the most common problem in daily routine practice. It is lifestyle induced disease. In now days lifestyle induced disorders are raised due to wrong lifestyle. In hypertension the main sign is rise in blood pressure. In this chapter we are going to study various aspects of hypertension and complication occurred due to hypertension that is Diabetic nephropathy . When We think about of hypertension then points comes under that from sign, symptoms, Diagnosis and treatment of hypertension but some time person with uncontrolled Diabetes and hypertension get complication like nephropathy and at the last management of complication is also necessary . Experience of hypertension with diabetes is very difficult thing for every patient and doctor too, so it is important to study hypertension, diabetes and its complication diabetic nephropathy is necessary hence I have selected this topic for observational study .

KEYWORD: Hypertension, diabetes, diabetic nephropathy

INTRODUCTION:

Hypertension is a major and increasing global health issue. It is a main cause of cardiovascular disease and premature mortality over the world wide due to its effects on end organs, and through its combination with chronic kidney disease, diabetes mellitus and obesity. Due to improper management , many patients didn't get proper blood pressure control. Hypertension assoted cardiovascular death rates are increasing in world due to chronic kidney disease, diabetes mellitus and obesity. The long-term effects of diabetes mellitus can leads to dysfunction, destruction and failure of various organs and systems¹.

AIM AND OBJECTIVES:

- 1) To study the relation between Hypertension and Diabetic nephropathy .
- 2) To study management of hypertension and diabetic nephropathy Hypertension and Diabetic nephropathy

MATERIALS AND METHODS: -

MATERIALS

- 201 diagnosed patients of Diabetic nephropathy were selected randomly.
- Special case paper Performa and a questionnaire was prepared before the Commencement of study was used for collecting information from the patients.
- Patients with increased BSL, Blood urea, Sr. Creatinine, Urine- Albumin included.

METHODS

- Type of study - Retrospective Observational Clinical Study
 - Sample size -201
 - Place – Bharati vidyapeeth Medical Foundation's Ayurved Hospital Pune - 43
 - Plan of work –
1. 201 diagnosed patients of Diabetic nephropathy were selected randomly.
 2. Hetu, lakshan, Samprapti of Diabetic Nephropathy in patients of Diabetic Nephropathy were studied with the help of Special case paper Performa and a questionnaire designed for study
 3. For this study we referred various samhitas for Ayurvedic references of Madhumeha
 4. Related modern text books also referred for modern reference

REVIEW OF LITERATURE

Hypertension

Definition of hypertension:

As per WHO hypertension can be says that, then the pressure in blood vessels is very high that is 140/90 mmHg or higher². It is common but can be serious if not treated. Hypertension means high blood pressure.

Types:

There are 2 types of hypertension

1. Essential hypertension
2. Secondary hypertension

1. Essential hypertension

Primary hypertension also known as essential hypertension. Many adults with hypertension are comes in this category. Specific cause doesn't known though many years of researched on hypertension, but can be with association on of hereditary, diet, lifestyle, and age factor³.

2. Secondary hypertension

Secondary hypertension cab be says as high blood pressure that has an identifiable cause or underlying condition⁴.

3. Malignant or accelerated hypertension:

This clinical entity may complicate hypertension of any etiology and characterized by accelerated small vascular damage with necrosis in the wall of small arterial vessels and arterioles and intravascular thrombosis.

Causes⁵:

1. Alcohol
2. Obesity
3. Renal Diseases :
 - Renal parenchymal disease
 - Polycystic kidney
 - Urinary tract obstruction
 - Rennin-producing tumor
4. Endocrine Diseases:
 - Hyperthyroidism
 - hypothyroidism
 - Hyperparathyroidism
 - Primary aldosteronism
 - Cushing syndrome
5. Drugs:
 - Oral contraceptives
 - Estrogen replacement therapy
 - Oral and Depot contraceptives,
 - Steroid medication

Diabetes Mellitus:

Types:

Classification of diabetes mellitus⁶

- Type 1 diabetes
 - a. Immune-mediated
 - b. Idiopathic
- Type 2 diabetes
- Other specific types
 1. Excess endogenous production of hormonal antagonists to insulin
 2. Viral infections (e.g. congenital rubella, mumps, Coxsackie virus B)
 3. Uncommon forms of immune-mediated diabetes Associated with genetic syndromes (e.g. Down's syndrome, Turner's syndrome, diabetes mellitus.
 4. Genetic defects of B-cell function
 5. Pancreatic disease
 6. Genetic defects of insulin action
 7. Klinefelter's syndrome, diabetes insipidus.
 8. Drug-induced (e.g. corticosteroids, thiazide diuretics, phenytoin)
- Gestational diabetes

Causes : ⁷

- Lifestyle and genetic factors.
- While some of these factors are under personal control, such as diet and obesity
- Increasing age,
- Genetics.

Pathology⁸

Type 2 diabetes is a more complicated condition than type 1 diabetes because there is a combination of resistance to the actions of insulin in liver and muscle together with impaired pancreatic B-cell function leading to 'relative' insulin deficiency. The natural history including physical inactivity, generous dietary intake and degree of obesity influences the occurrence of type II Diabetes Mellitus. Insulin resistance appears to come first, and leads to elevated insulin secretion in order to maintain normal blood glucose levels. hence, in susceptible person the pancreatic B cells are unable to sustain the increased demand for insulin and a slowly progressive insulin deficiency develops

Sign and Symptoms : ⁹

- Thirst, dry mouth
- Blurring of vision
- Pruritus vulvae,
- Polyuria
- Hyperphagia; predilection for sweet foods
- Mood change, irritability, difficulty in concentrating, apathy
- Nocturia
- Tiredness,
- fatigue
- Recent change in weight
- balanitis (genital candidiasis)
- Nausea; headache

Relation between hypertension and diabetes mellitus:¹⁰

Hypertension is a main independent risk factor for chronic kidney disease and cardiovascular diseases, when hypertension is associated with diabetes mellitus, risk is increased even further. Although arguments exists regarding the optimal level for hypertension reduction, consistent control of blood pressure in patients with DM is important for preventing and delaying both macrovascular and microvascular complications.

DIABETIC NEPHROPATHY

One significant consequence of diabetes mellitus is renal involvement. Deaths from end-stage kidney disease, or renal failure affect almost 10% of diabetic patients. In type 1 Diabetes mellitus, renal problems are more severe, manifest earlier, and occur more frequently than in type 2 diabetes mellitus. Diabetic nephropathy is linked to a number of clinical symptoms, such as nephrotic syndrome, progressive renal failure, hypertension and silent proteinuria.

Patients with diabetes mellitus who have end-stage renal disease are 40 times more likely to have cardiovascular disease than people without the condition. And cardiovascular problems account for a greater proportion of diabetic deaths than uraemia.

Morphology:

Diabetic glomerulosclerosis, vascular lesions, diabetic pyelonephritis, and tubular lesions (Armani-Ebstein lesions) are the four forms of renal lesions that are included in diabetic nephropathy in diabetes mellitus.

1. GLOMERULOSCLEROSIS:

In diabetes mellitus, glomerular lesions are very prevalent and are responsible for most aberrant results that may be attributed to the kidney.

The following series of modifications helps to understand the pathogenesis of various lesions in diabetes mellitus: Hyperglycemia leads to glomerular hypertension, which in turn causes renal hyperperfusion, protein accumulation in the mesangium, glomerulosclerosis, and ultimately renal failure. Furthermore, growth hormones, specifically transforming growth factor- β , are responsible for the cellular infiltration in renal lesions in diabetic glomerular lesions. In these individuals, strict blood glucose management and systemic hypertension control delay the onset of diabetic nephropathy. Diabetes related glomerulosclerosis can manifest as diffuse or nodular lesions.

i) Diffuse glomerulosclerosis: the majority of glomerular lesions are diffuse. Every component of the glomeruli is affected. Thickening of the GBM and a diffuse increase in the mesangial matrix with modest mesangial cell proliferation are the pathogenic alterations. There may also be a variety of exudative lesions, including fibrin capsand capsular hyaline drips.

Capsular drop which protrudes into the glomerular space, is an eosinophilic hyaline thickening of Bowman’s capsule’s parietal layer. The fibrin cap is the uniform, vividly eosinophilic substance that develops on the lobule’s peripheri capillary wall.

ii) Nodular glomerulosclerosis: Kimmelstiel-Wilson (KW) lesion or intercapillary glomerulosclerosis are other names for the nodular lesion associated with diabetic glomerulosclerosis. Type 1 diabetes (Juvenile onset) and islet cell antibody-positive diabetes mellitus are the conditions for which these lesions are specific. One or more nodules in one or more glomeruli make up the pathogenic alterations. A nodule is an ovoid or spherical, hyaline, laminayed acellular substance that is situated inside a glomerulus lobule. The glomerular capillary loops that encircle the nodule may have thickened or normal GBM. The nodules include fibrin and lipid and are PAS-positive. The glomerular capillaries are compressed by the growing nodular lesion, which destroy the glomerular tuft. Renal ischaemia is brought on by glomerular and arteriolar involvement, which results in tubular atrophy, interstitial fibrosis, and a severly undersized, contracted kidney.

2. THE VASCULAR LESIONS:

Renal artery atheroma is extremely prevalent and severe in those with diabetes mellitus. In diabetics, hyaline arteriolosclerosis, which affects the glomeruli's afferent and efferent arterioles, is frequently severe. These vascular lesions cause renal ischemia, which in turn causes interstitial fibrosis and tubular atrophy.

3. PYELONEPHRITIS IN DIABETES:

Bacterial infections are very common in diabetics with poorly managed diabetes. A significant side effect of diabetes that can lead to acute pyelonephritis is papillary necrosis, also known as necrotizing papillitis. Diabetics are 10-20 times more likely than non diabetics to develop chronic pyelonephritis.

4. TUBULAR LESIONS (Armani-Ebstein Lesions):

When diabetes is left untreated and blood sugar levels are dangerously high, the proximal convoluted tubules’ epithelial cells accumulate large glycogen deposits that resemble vacuoles. We refer to these as Armani-Ebstein Lesions. When the hyperglycemia condition is under control, the tubules revert to normal.11Symptoms and Signs of Diabetic Nephropathy

- i. Dryness of mouth
- ii. Nausea
- iii. Vomiting
- iv. Pain in abdomen
- v. Anaemia
- vi. Facial puffiness
- vii. Pedal edema
- viii. Edema
- ix. Oligo urea
- x. Anurea
- xi. Difficulty in Micturation
- xii. Burning Micturation
- xiii. Painful Micturation

Parameter	Chi sq test statistics	p value
DN with HTN	12.7035	5.32E-03

Observation:

As per observations of the study there is strong relation in between hypertension and diabetic nephropathy Association of diabetic nephropathy with hypertension parameter-

Here we can conclude that hypertension is a causative factor for diabetic Nephropathy in Diabetic Patients

Discussion: -

Now days number of lifestyle induced diseases increases due to advanced lifestyle. It can be says that hypertension and Diabetic are the lifestyle induced diseases. Diabetic nephropathy is the one of early forming and most common complication in patent who has association of hypertension with of type 2 diabetic mellitus.

Conclusion: -

Due to technology and fast lifestyles there are risks of increase in lifestyle induced disorder so diseases like hypertension and Diabetic and its complication like diabetic nephropathy it can be treated by good blood pressure and glycemic control and pharmacological treatments. By this study it is concluded that hypertension is a causative factor for diabetic Nephropathy in Diabetic Patients

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