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Research Article

"PROSPECTIVE ANALYSIS OF PREVALENCE AND EFFECT OF LIVER DISEASES IN TYPE II DIABETES PATIENTS: A CROSS SECTIONAL, OPEN LABEL, SINGLE CENTRIC, PILOT STUDY"

Mehar Govind

Maharishi Arvind Institute of Pharmacy, Jaipur, Rajasthan

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ABSTRACT

That Patients Who has a Liver disease, May because of type 2 diabetes .In cirrhosis Patients diabetes may be occur. In diabetic patients cirrhosis may be occur diabetic play an important role of liver disease.

In Diabetic Patients, The Normal Level of SGPT and SGOT may Increase than the Chances of Liver Disease. In Liver Disease patients, The Normal Level of SGPT and SGOT Increase than the Chances of Diabetes. Treatment of diabetes may be complex.

Key Words: Cirrhosis, Liver disease, SGPT and SGOT Level

INTRODUCTION

1. DIABETES

- Diabetes is a defect in the body's ability to convert glucose (sugar) to energy. Glucose is the main source of fuel for our body. When food is digested it is changed into fats, protein, or carbohydrates. Foods that affect blood sugars are called carbohydrates.
- Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both. The chronic hyperglycemia of diabetes associated with long term damage, dysfunction, and failure of various organs especially the eyes, kidneys, nerves, heart and blood vessels. Carbohydrates, when digested, change to glucose.(ICMR)

2. SYMPTOMS: • Blurred vision
• Unusual thirst
• Frequent urination
• Slow-healing cuts • Unexplained tiredness • Rapid weight loss.

3**. LIVER DISEASE:**

- Liver disease (also called hepatic disease) is a type of damage to liver cell or disease of the liver.
- The symptoms related to liver dysfunction include both physical signs and a variety of symptoms related to digestive problems, blood sugar problems, Immune disorders, abnormal absorption of fats, and metabolism problems.

4. SIGN AND SYMPTOMS

- The symptoms related to liver dysfunction include both physical signs and a variety of symptoms related to digestive problems, Coagulopathies blood sugar problems, Immune disorders, abnormal absorption of fats, and metabolism problems. The Malabsorption of fats may lead to symptoms that include indigestion, reflux, deficit of fat soluble Vitamins, Hemorrhoids, Gallstones, and Intolerance to fatty foods, intolerance to alcohol, Nausea and vomiting attacks, abdominal bloating, and Constipation. Nervous system disorders include depression, mood changes, especially anger and irritability, poor concentration and "Foggy brain", overheating of the body, especially the face and torso, and recurrent headaches (including migraine) associated with nausea.

5. **LIVER BLOOD ENZYME:**

- The most sensitive and widely used liver enzymes:
- Aspartate Aminotransferase (AST or SGOT)
- Alanine Aminotransferase (ALT or SGPT).
- These enzymes are normally contained within liver cells. If the liver is injured, the liver cells spill the enzymes into blood, raising the enzyme levels in the blood and signaling the liver damage.

6. ELEVATED AST and ALT

- AST (SGOT) and ALT (SGPT) are sensitive indicators of liver damage from different types of disease. But it must be emphasized that higher-than-normal levels of these liver enzymes should not be automatically equated with liver disease. They may mean liver problems or they may not. The interpretation of elevated AST and ALT levels depends upon the whole clinical picture and so it is best done by doctors experienced in evaluating liver disease.
- The precise levels of these enzymes do not correlate well with the extent of liver damage or the prognosis

Corresponding author: Mehar Govind |E-mail: govinddreams95@yahoo.com

(outlook). Thus, the exact levels of AST (SGOT) and ALT (SGPT) cannot be used to determine the degree of liver disease or predict the future. For example, patients with acute viral hepatitis A may develop very high AST and ALT levels (sometimes in the thousands of units/liter range). But most patients with acutviral hepatitis A recover fully without residual liver disease. For a contrasting example, patients with chronic hepatitis C infection typically have only a little elevation in their AST and ALT levels. Some of these patientsmay have quietly developed chronic liver disease such as chronic hepatitis and cirrhosis (advanced scarring of the liver)

7. AST and ALT the Normal Range of values for:

AST (SGOT) is from 5 to 40 units per liter of serum (the liquid part of the blood).

ALT (SGPT) is from 7 to 56 units per liter of serum.

8. DECREASE SGPT and SGOT LEVEL :

Serum glutamate pyruvate transaminase (SGPT), now called Alanine aminotransferase (ALT), is a liver enzyme that is vital for energy production. It is present in different tissues such as the liver, skeletal muscles and heart, but is found with the highest concentration in the liver. When the liver is damaged, SGPT leaks out of the cells and into your blood. Normal SGPT level ranges from 7 to 56 units per liter of blood. High levels of SGPT in the blood may indicate liver problems and damage, but they may also be elevated due to strenuous activity.

Diet Modifications:

Get more vitamin D. A damaged liver allows SGPT to seep into the blood. According to a recent study, vitamin D prevents liver damage, which aids in reducing SGPT levels – those with high levels of vitamin D are less vulnerable to liver disease than those with low levels of vitamin D. Therefore, it's a good idea to include at least one fruit and vegetable in each major meal to have a daily dose of vitamin D, staving off liver disease.

Good sources of vitamin D are green leafy vegetables, cod liver oil, fish, fortified cereals, oysters, caviar, tofu, soy milk, dairy products, eggs, mushrooms, apples and oranges.

Eat a nutrient-rich, plant-based diet. Eating organic foods helps regulate the liver, allowing it to cleanse itself of toxins and create new cells to stop the leakage of SGPT into the blood. These foods are often rich in antioxidants, vitamins, and minerals, in addition to being low in fat – in other words, they're great for your entire body. Focus your diet on fresh, whole foods that you've prepared yourself. Stay away from products that have gone through unnecessary processing, ridding them of their nutrients.

- Make sure your diet has a lot of color. Green leafy vegetables, broccoli, carrots, squash and a variety of fresh fruits should be staples of your diet, along with nuts, whole grains, low-fat dairy products and lean meats.

Avoid foods high in fat. Fatty foods make it hard for the liver to process nutrients in general. Some fat in the liver is normal, but if your liver is more than 10& fat, you know have a condition called "fatty liver" disease.[2] The presence of these fatty cells can then lead to inflammation in the liver and damage to surrounding liver tissue.[3] If the liver is damaged, the damaged liver cells release SGPT into the bloodstream, increasing your levels.

- It is best to avoid fatty foods such as oily foods that are deep fried, meat fats, pork and chicken skins, coconut oils, butter, cheese, processed foods, sausages, bacon, junk foods and carbonated drinks.

Avoid foods high in salt or sodium. Excessive amounts of salt in the body, especially in the liver, cause swelling and fluid retention. This makes it harder for the liver to filter waste. This, over time, can lead to liver damage, allowing SGPT from the liver to seep into your bloodstream, raising your levels.

- Foods to be avoided are salt, bouillon cubes, baking soda, soy sauce, salad dressings, bacon, salami, pickled foods, and other processed foods. Avoid adding salt to your dishes whenever possible.
- Since salt is prevalent everywhere, try to do more of your cooking at home to control your intake. The average adult needs only 2300mg (1 teaspoon) a day.

Stop drinking alcoholic beverages. Alcohol is very harmful to the liver and, with prolonged drinking, can shut down entirely. When alcohol is ingested it goes directly to the bloodstream. All the blood is then received and filtered in the kidney. It is now the liver's job to filter all the toxic waste in the body, including toxins from alcohol. This, over time, can create serious liver damage.[5] The more damaged your liver is, the more SGPT can leak out of its cells and into your blood.

- Alcohol consumption has been a major contributor to liver diseases such as fatty liver, liver cirrhosis, and hepatitis. Exercise self-discipline to avoid aggravating diseases caused by too much alcohol consumption that will help in decreasing SGPT from leaking into your blood stream.

Get daily exercise. Simple exercises such as brisk walking, jogging, and swimming can improve your overall health in addition to helping your liver stay healthy. Staying active excretes toxins in the body through sweating. It also helps burn fats, keeping you trim. Exercise will produce more lean muscles, healthy organs – including your liver – and keep your body in tip-top condition. The fewer toxins

your liver has to clean up, the more energy it can dedicate to strengthening its cells.

- At least 30 minutes of daily exercise every day can make a difference in your liver's health. When toxins are excreted it reduces the amount of work that the liver will be doing, thus preventing increased SGPT levels.

Quit smoking. Smoke from cigarettes contains toxins like nicotine and ammonia. When you are exposed to these toxins, they stick to your skin and will be absorbed, giving the liver another workload to filter, getting rid of all the toxins in your body. It's best to avoid secondhand smoke, too, as this has similar effects.

- Not only is it bad for your SGPT levels, but it's bad for your heart, lungs, kidneys, skin, hair and nails, too. It also causes those around you undue discomfort. If your SGPT levels aren't enough, do it for these reasons instead.

Prevent exposure to other harmful chemicals, too. Smoke from air pollution contains fumes, gasoline, and ammonia, amongst other harmful chemicals that have dissipated in the air. If you live or work around an environment where you are constantly exposed to these toxins, reduce your exposure as much as possible. These toxins may leak through your skin causing liver damage and raising your SGPT levels.

- If you must be around toxic fumes, wear long sleeves, pants, a mask, and gloves at all times. The more precautions you take, the healthier you'll be – especially in the long-term.

Stop taking over-the-counter drugs. If your liver is already damaged and you continue to take drugs that your physician did not prescribe, the liver carries the burden of metabolizing these drugs and filtering harmful substances which can further contribute to liver damage. It is best to take only the drugs which your doctor okays you to take.

If in doubt, consult with your physician. There are drugs that are hepatotoxic (toxic to the liver) and he/she may shift you to non-hepatotoxic drugs.

Medications such as antibiotics and non-steroidal anti-inflammatory drugs (NSAIDs) can cause elevated SGPT and SGOT levels. It's wise to talk to your primary doctor about different types of medications to prevent possible liver damage.

Consider taking corticosteroids. This medication works by reducing the activity of the body's immune system. It also decreases inflammation by reducing the production of inflammatory chemicals to lessen tissue damage. These can be taken orally or can be injected through a vein. The most common corticosteroids are Hydrocortisone, Prednisone and Fludrocortisone.

- Once the inflammation subsides, the liver cells will start to regenerate, therefore decreasing the release of SGPT into the bloodstream.
- Talk to your doctor about starting corticosteroids. No medication should be started without a doctor's approval.

Take antiviral medications. The liver may have infection caused by a virus, such as what happens in hepatitis. Upon conducting a blood test, your physician will know what virus is the underlying cause of the infection and will prescribe antiviral medications such as Entecavir, Sofosbuvir, Telaprevir and others.

- This works in the same manner as corticosteroids. Once the infection is eradicated, the liver cells will start to regenerate, therefore decreasing the release of SGPT into the bloodstream.

Consider taking herbal supplements. Lifestyle medications paired with herbal supplements may help lower SGPT levels. Talk to your doctor to see if any of these is safe and appropriate for you. Possible supplements to consider are the following:

- Milk thistle. Prevents and repairs liver damage from toxic chemicals and harmful medications. It's available in 100mg to 1000mg forms. The standard dosage of milk thistle is 200 mg 2 to 3 times a day.[6]
- Inositol. Helps the liver in breaking down the fats. However, this can cause abdominal pain and diarrhea. It's available in 500mg and 1000mg forms. You can take 500mg thrice daily.
- Burdock root. Helps in cleansing the liver and prevents further liver damage. It's available in 500mg to 1000mg forms. You can take 500mg thrice daily.
- Talk to your doctor about taking interferons. These are proteins released by the body's host cells as a response to the presence of foreign bodies such as viruses, bacteria, tumor cells, or parasites. Taking this medication triggers the protective defenses of the body's immune system to kill these foreign bodies.
- SGPT starts decreasing once the infection is eradicated. The liver cells will start to regenerate, regularizing your levels. With new cells, SGPT cannot leak into your bloodstream.
- Get a blood sample taken. Your level of SGPT is measurable through a blood sample. In case of acute liver damage, SGPT levels rise dramatically as it is now able to leak through cell walls into your blood. However, a rise in SGPT levels must be verified carefully because it may be elevated due to recently performing strenuous activities or exercises.
- An elevation in SGPT's level is not a confirmation of a diagnosis of damage to the liver. It must be used together

with the other types of liver tests in order to verify whether a patient really suffers from damage to the liver.

9. RELATION OF DIABETES AND LIVER DISEASE:

- In Diabetic Patients, The Normal Level of SGPT and SGOT may Increase than the Chances of Liver Disease.
- In Liver Disease patients, The Normal Level of SGPT and SGOT Increase than the Chances of Diabetes.

10. RESULTS

10.1 STUDY SUBJECTS

Total of the 200 patients were enrolled in to study from investigational site. Total 200 patients received medicines as prescribed by concern doctor.

10. 1.1. DETAIL OF PATIENTS- AGE, SEX, DURATION OF DIABETES, RESIDENCE AND NATURE OF DIABETES

AGE

The age of enrolled 200 patients was <50 yr 122 patients (61%), 50- 70 yr 50 patients (25%), >70 yr 28 patients (14%). Demographic summary of the patients represented in table (Table 10.1)

Table: Details- Age of Patients

Age	Frequency	Percent
<50 yr	122	61%
50- 70 yr	50	25%
>70 yr	28	14%
Total	200	100%

DURATION OF DIABETES

Newely diagnosed 20 patients with <50 yr age group, 16 patients with 50- 70 yr age group, 03 patients with >70 yr age group) (27.46%), found out of total 142 patients, Frequency 142, and age group <50 yr 85 patients .50-70 age group 40 patients . >70 yr patients age group 17 patients.

Table: Detail- Duration of Diabetes

Duration of Diabetes	Frequency	Age Group			Percent
		<50 yr	50- 70 yr	>70 yr	
Newly Diagnosed	39	20	16	3	27.46%
0-5 years	24	16	4	4	16.90%
6-10 years	31	21	7	3	21.83
11-15 years	48	28	13	7	33.80
Total	142	85	40	17	100%

SEX

Out of 200 patients total 29 patients (14.5%) were female and 171 (85.5%) patients were male, which were enrolled in this study. Detail of patients on the basis of Sex is represented in table ..

Table: Details- Sex of Patients

Sex	Frequency	Percent
Female	29	14.5%
Male	171	85.5%
Total	200	100%

RESIDENCE

Total 158 patients (79%) were from urban area and 42 patients (21%) were from rural area, involved in this study. Detail of patients on the basis of residence is represented in table

Table: Details- Residence of Patients

Residence	Frequency	Percent
Rural	42	21%
Urban	158	79%
Total	200	100%

NATURE OF DIABETES

On the basis of nature of Diabetes or type of Case total 103 patients (72.53%) were old cases, out of which 26 patients were of <50 yr age group, 55 patients were of 50-70 yr age group and 10 patients were of >70 yr age group. 39 patients (27.46%) were newly diagnosed cases, out of which 16 patients were of <50 yr age group, 61 patients were of 50-70 yr age group and 32 patients were of >70 yr age group. Detail is shown in table .

Table: Detail- Nature of Diabetes

Nature of Diabetes	Frequency	Age Group			Percent
		<50 yr	50- 70 yr	>70 yr	
Old	103	26	55	10	72.53%
Newly Diagnosed	39	16	61	32	27.46%
Total	142	42	116	42	100%

10.2 STATISTICAL DETAILS:

Out of the 200 patients, 171 patients are Male .In 171 patients Diabetes are found 118(69%) and Non Diabetes patients are 53(30.99%).

TOTAL MALE (171)		
	Frequency	**Percent**
Diabetes	118	69.00%
Non Diabetes	53	30.99%
Total	171	100%

Statistical Details-(Total Male- 171) , Maximum diabetes 118 ,Minium Non diabetes 53,
Mean 85.5, standard deviation 45.96194

Table 10.2.1: Statistical Details-(Total Male- 171)

SEX	MALE
Minimum	53
Maximum	118
Mean	85.5
SD	45.96194

Out of the 118 Diabetes Male patients, 29(24.57%) patients are found Liver Disease and 89(75.42%) patients are found Non Liver Disease .

DIABETES MALE (118)		
	Frequency	**Percent**
Liver Disease	29	24.57
Non Liver Disease	89	75.42
Total	118	100%

Statistical Details-(Diabetes Male- 118), Minimum Liver disease 29 ,Maximum Non Liver disease 89, Mean 59, standard deviation 42.42641

Table10.2.2: Statistical Details-(Diabetes Male- 118)

SEX	MALE
Minimum	29
Maximum	89
Mean	59
SD	42.42641

Out of the 53 patients, 18(33.96%) patients are found Liver Disease and 35(66.03%) patients are found Non Liver Disease .

NON DIABETES MALE(53)		
	Frequency	**Percent**
Liver Disease	18	33.96
Non Liver Disease	35	66.03
Total	53	100%

Statistical Details-(Non Diabetes Male- 53), Minimum Liver disease 18 ,Maximum Non Liver disease 35, Mean 26.5, standard deviation 12.0208

Table6.1.2.3: Statistical Details-(Non Diabetes Male- 53)

SEX	MALE
Minimum	18
Maximum	35
Mean	26.5
SD	12.02082

Out of the 200 patients, 29 patients are Female .In 29 patients Diabetes are found 24(82.75%) and Non Diabetes patients are 05(17.24%).

TOTAL FEMALE(29)		
	Frequency	**Percent**
Diabetes	24	82.75
Non Diabetes	05	17.24
Total	29	100%

Statistical Details-(Total Female - 29) Maximum diabetes 24 , Minimum Non diabetes 05, Mean 14.5, standard deviation 13.43503

Table 10.2.4: Statistical Details-(Total Female - 29)

SEX	FEMALE
Minimum	05
Maximum	24
Mean	14.5
SD	13.43503

Out of the 24 Diabetes female patients, 04(16.66%) patients are found Liver Disease and 20(83.33%) patients are found Non Liver Disease.

DIABETES FEMALE(25)		
	Frequency	**Percent**
Liver Disease	04	16.00
Non Liver Disease	20	80.00
Total	25	100%

Statistical Details-(Diabetes Female- 24) Minimum Liver disease 04, Maximum Non Liver disease 20, Mean 12, standard deviation 11.31371

Table 10.2.5: Statistical Details-(Diabetes Female- 25)

SEX	FEMALE
Minimum	05
Maximum	20
Mean	12.5
SD	10.6066

Out of the 05 Non Diabetes Female patients, 02(40%) patients are found Liver Disease and 3(60%) patients are found Non Liver Disease .

NON DIABETES FEMALE(05)		
	Frequency	**Percent**
Liver Disease	02	40
Non Liver Disease	03	60
Total	05	100%

Statistical Details-(Non Diabetes Female - 05) Minimum Liver disease 02 ,Maximum Non Liver disease 03, Mean 2.5, standard deviation 0.707107

Table 10.2.6: Statistical Details-(Non Diabetes Female - 05)

SEX	FEMALE
Minimum	02
Maximum	03
Mean	2.5
SD	0.707107

TOTAL DIABETES PLUS LIVER DISEASE PATIENTS(33)		
	Frequency	**Percent**
MALE	29	87.87
FEMALE	04	12.12
Total	33	100%

Table 10.2.7: Statistical Details-(Total diabetes plus liver diseases patients - 33)

SEX	MALE AND FEMALE
Minimum	04
Maximum	29
Mean	16.5
SD	17.67767

	Sex	**Age Group**			**Percent**
		<50 yr	50- 70 yr	>70 yr	
Total diabetes plus liver diseases patients - 33	Male(29)	19	08	2	87.87
	Female(04)	2	1	1	12.12

Duration of diabetes plus liver diseases patients Male - 29

Duration of diabetes plus liver diseases patients Male	**Age Group**		
	<50 yr	50- 70 yr	>70 yr
Newly Diagnosed	05	2	3
0-5 years	6	1	0
6-10 years	4	2	0
11-15 years	4	2	0
Total	19	07	03

Duration of diabetes plus liver diseases patients Female - 04

Duration of diabetes plus liver diseases patients Female	**Age Group**		
	<50 yr	50- 70 yr	>70 yr
Newly Diagnosed	1		0
0-5 years	1	1	0.
6-10 years	0	0	0
11-15 years	0	0	1
Total	2	1	1

Statistical Details 10.2.8 -(SGOT AND SGPT TEST):-

SEX	MALE AND FEMALE	
	SGOT	SGPT
Minimum	19	27
Maximum	99	99
SD	19.3194021	15.28093

11. CONCLUSION

A Pilot Prospective Study "A Prospective Analysis Of prevalence And Effect of Liver Disease in Type II Diabetes Patients" Was carried out in Heart and General Hospital Jaipur.

Total 200 Patients Were Scrutined For The Connection Of Diabetes And Liver Disease.

Serum SGOT And SGPT Level Were Used To Determine Their Connection.

Our Study Concluded That There Were 118 Patients Diagnosed or Found with Diabetes, Out Of Which 29 Patients Were Male had Liver Disease .Maximum Male Diabetic Patients Were Showed Connection between Diabetes and Liver Disease.

Similarly 4 Out Of 24 Female Diabetic Patients Showed Connection Between Liver Disease And Diabetes.

Our Study Concluded That Male Diabetic Patients are More Prone to Liver Disease than Female Patients

Male Diabetic Liver Disease Patients , Were Maximum From Less Than <50 year Of Age and Of Up To 6 Year Duration Of Diabetes .Geriatric Patients Were Only 3 Found Under This Category , Due to Of Less Number Of Admission in Hospital .

Female with Age Group Less Than 70, were Found with Duration Maximum Up to 5 years With Liver Disease.

Both Data for Male and Female Showed That Younger Patients than Geriatric Were More Suffered From Both Chronic Disease, Due to of any one of the Reason of Disease.

So Finally Concluded That an Epidemiological Study proposed to be carried out For the Declaration between Diabetes and Liver disease.

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