Degree	Year	Name of College & University	Registration number with date of registration	Name of State Medical council
MBBS	2003	LLRM MEDICAL COLLEGE, CCS UNIVERSITY, MEERUT	48801 07/04/2004	UPSMC
MD/MS	2008	SNMC AGRA, DR BR AMBEDKAR UNIVERSITY,	15563 03/05/2008	UPSMC

NMC Regional Centre for Medical Education Technologies
MAULANA AZAD MEDICAL COLLEGE, NEW DELHI
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This is to certify that Dr. Shweta Sharma from Department of Medicine has participated in the Revised Basic Course Workshop in Medical Education Technologies conducted by Medical Education Unit, LLRM Medical College, CCS University, Meerut and NMC Regional Centre, MAMC, New Delhi from 22nd July-24th July, 2021

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Director General, Indian Council of Medical Research
New Delhi, India

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Research Article

Hepatitis C, Hepatitis B, and their Co-Infections in Patients with Hepatic Cirrhosis

Ekta Rani[1]*, Shama Tomar[1], Swati Tewari[2] and Shweta Sharma[3]

[1]National Institute of Medical Sciences and Research NIMS University Jaipur-303121, Rajasthan, India
[2]National Capital Region Institute of Medical Science, Meerut-245206, Uttar Pradesh, India
[3]Lala Lajpat Rai Memorial Medical College and Hospital, Meerut-250004, Uttar Pradesh, India
*Corresponding author email id: ektagupta2629@gmail.com

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ABSTRACT

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The cases of viral hepatitis have been rapidly increasing in the Meerut region of Uttar Pradesh. Identifying the etiological profile among liver cirrhosis patients in tertiary care centers is crucial for understanding the associated disease burden. This study aims to estimate the prevalence of Hepatitis B virus (HBV) and Hepatitis C virus (HCV) infections among liver cirrhosis patients in the western Uttar Pradesh region. From May 2021 to March 2022, a prospective study was conducted on 278 liver cirrhosis patients. Venous blood samples were analyzed for hepatitis B surface antigen (HBsAg) and anti-HCV antibodies using sandwich ELISA technique and solid-phase immunochromatography. Of the 278 enrolled patients, 66 (23.7%) were found positive for viral hepatitis infection. Out of the positive cases, 74% were male and 25.8% were female, with a mean age of 41 years. Among the cirrhosis cases, 14.7% were positive for hepatitis C infection, 7.9% for hepatitis B infection, and 1.1% for HCV+HBV co-infection. The most common age group with viral infection-related cirrhosis was 41-60 years in urban areas. Hepatitis C Virus and HBV are the major causes of cirrhosis in this study region. The Western Uttar Pradesh region is a prevalent area for Hepatitis C Virus and HBV infections. Our results emphasize the common occurrence of viral infection-related cirrhosis in our region, with co-infection of Hepatitis C Virus and HBV being less common.

Keywords: Cirrhosis, Co-infection, Hepatitis B, Hepatitis C

INTRODUCTION

Hepatitis C virus (HCV) is a hepatotropic virus and a significant cause of liver disease, posing substantial morbidity and mortality worldwide. With an estimated infection rate of about 3% of the global population, HCV primarily spreads through parenteral routes, including injection drug use, blood transfusion, unsafe medical practices, and other healthcare-related procedures. Hepatitis C Virus infection initially leads to mostly subclinical acute hepatitis, progressing to chronic hepatitis in about 80% of cases (Forman and Valsamakis, 2011). Chronic Hepatitis C Virus infection elevates the risk of chronic liver disease (CLD), cirrhosis, and primary hepatocellular carcinoma (HCC). It's estimated that Hepatitis C Virus contributes to 27%

of cirrhosis and 25% of the HCC cases worldwide (Alter, 2007). Approximately 325 million people globally live with Hepatitis C Virus (HCV) infection, and a majority lack access to crucial testing and treatment (WHO Global Hepatitis Report, 2017). This situation places millions at risk of slow disease progression, cancer, and death. In 2015 alone, around 1.75 million people acquired Hepatitis C Virus infection, increasing the global population living with the virus to 71 million (WHO, 2017).

Patients with chronic hepatitis C may develop cirrhosis in 5-20% of cases over ten to twenty years, and around 25% of them could advance to end-stage liver disease and hepatocellular carcinoma (HCC) (Ray, 2015). Hepatitis B viral infection and hepatitis C viral infection are distinct viruses with completely different life cycles (Desikan and Khan, 2017). Despite this, they share similarities in global distribution, hepatotropism, modes of transmission, and the ability to cause chronic infections leading to liver cirrhosis and HCC in humans (Papadopoulos *et al.*, 2018).

Patients co-infected with both Hepatitis B Virus and Hepatitis C Virus tend to have more severe liver disease, facing an increased risk of progression to HCC and Chronic Liver Disease (Brass and Moradpour, 2009). The study of hepatitis B virus and hepatitis C virus interactions has been challenging due to the lack of convenient model systems (Gaeta *et al.*, 2003). Dual infection with hepatitis B virus and hepatitis C virus in the same host ranges from 1 to 15% (Hassuna *et al.*, 2022). In our country, there are conflicting reports, with some emphasizing hepatitis B infection and others hepatitis C viral infection as the most significant infections in chronic liver disease patients based on various regions. Data on Hepatitis B Virus and Hepatitis C Virus infection in different liver diseases from the western Uttar Pradesh region is limited. We conducted this prospective study to assess the prevalence of Hepatitis B Virus and Hepatitis C Virus infections, including their co-infection, among liver cirrhosis patients in the Meerut region.

MATERIALS AND METHODS

An observational prospective study was conducted from April 2021 to March 2022 on patients attending the Medicine Department at Lala Lajpat Ram Memorial Medical College, Meerut, in collaboration with the Microbiology Department at the National Capital Region Institute of Medical Sciences, Meerut, Uttar Pradesh, India. A total of 247 patients diagnosed with cirrhosis were included in the study, and informed consent was obtained from all participants. Relevant patient history and information were collected using a standardized performa. A 5 ml blood sample was collected from each patient, and the serum was separated for screening. Qualitative detection of HBsAg and HCV-specific antibodies was performed using the 3rd generation ELISA assay, following procedures outlined by Kosack and Nick (2016) and Chowdhury (2004).

Interpretation of the test results followed the manufacturer's instructions. Ethical approval from the Institutional Ethics Committee (Approval No: NIMSUR/IEC/2021/0126) was obtained prior to the commencement of the study.

RESULTS AND DISCUSSION

A total of 278 samples were obtained from cirrhosis patients, categorized based on socio-economic status, over the course of a year for the present study. Among these, 66 (23.7%) cirrhosis patients tested positive for viral hepatitis infection. Hepatitis C virus was the most common agent detected in 41 cases (14.7%), followed by Hepatitis B virus in 22 cases (7.9%). Additionally, 3 cases (1.1%) reported co-infection with both Hepatitis C Virus and Hepatitis B Virus (Figure 1).

The present study revealed an exceptionally high percentage of viral infections in cirrhosis patients, accounting for 23.7% in our region. A

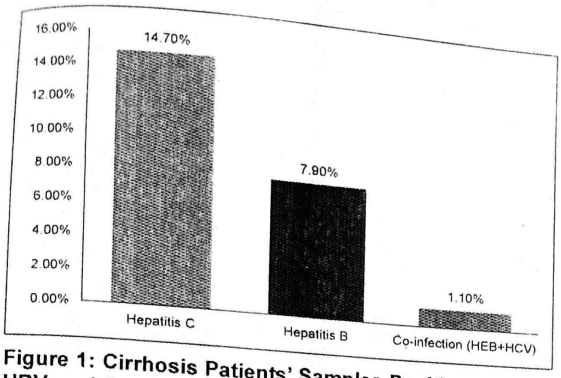

Figure 1: Cirrhosis Patients' Samples Positive for HCV, HBV, and Co-infection

similar finding was reported by Ali *et al.* (2008), who found a prevalence of 2.2% in the Aligarh region. In contrast, the study conducted by Singh *et al.* (2020) reported a lower prevalence.

Hepatitis C infection was detected in 14.7% of cirrhosis patients in the present study, which is comparable to the finding from eastern India, where Ray *et al.* (2000) reported a prevalence of 14.9%. Various authors have reported significantly variable prevalence rates based on diverse regions. High prevalence rates of HCV infection have been reported from Delhi by Singh *et al.* (2004) at 37.5%, D'Amico *et al.* (2006) at 35%, whereas very low rates were reported by Arankalle *et al.* (1995) at 0.2% in Western India, Sharma *et al.* (2016) at 2.8%, Trimukhe *et al.* (2011) at 3%, and Ali *et al.* (2008) at 4%. Furthermore, Singh *et al.* (2020) reported a prevalence of 6.6%, Hassuna *et al.* (2022) at 6%, Baseke *et al.* (2015) at 5.6%, and Lin *et al.* (2020) at 5.7%. Thus, HCV appears to be the dominant virus compared to HBV in causing cirrhosis. However, further comprehensive studies are needed to ascertain the exact prevalence of Hepatitis C Virus and Hepatitis B Virus among patients in the region.

Among the 66 cirrhosis patients, 7.9% tested positive for Hepatitis B virus, indicating a relatively high prevalence. A similar finding was reported by Singh *et al.* (2004) at 4%. Various previous studies have shown lower prevalence rates, which are comparable to the study by Singh *et al.* (2020) at 0.6%, Malhotra *et al.* (2016) at 1.5%, and Hassuna *et al.* (2022) at 0.9%. In contrast, higher prevalence rates were reported by Devi *et al.* (2004), Mathur *et al.* (2002), Kumar *et al.* (2003), Grewal *et al.* (2018), and Ali *et al.* (2008), with rates of 17.3%, 5.89%, 17.34%, 26%, and 36.7% respectively. The Aligarh region appears to have a higher prevalence of hepatitis infections based on available literature.

The prevalence of co-infection with both HCV and HBV viral infections was 1.1%, which is similar to the findings of Singh *et al.* (2020) at 0.7%, Malhotra *et al.* (2016) at 0.8%, and Lin *et al.* (2019) at 0.7%, and slightly higher than Ali *et al.* (2008) at 0.3%.

Among the 66 positive viral infection cases, 28 (42.4%) were in the age group of 41–60 years, 15 (22.7%) in the age group of 21–40 years, 9 (13.6%) in the age group above 61 years, and 4 (6%) in the age group of 0–20 years. Overall, the age ranged from 18 to 65 years, with a mean age of 41 years. Of the 41 HCV cases, 22 (53.7%) were in the 21-40 age group, and for the 22 HBV cases, 13 (59.1%) were in the 21-40 age group. Among the 3 co-infection cases with Hepatitis C Virus and Hepatitis B Virus, the age distribution was 41-60 (66.7%) and 21-40 (33.3%). Statistical analysis did not reveal a significant difference among the various age groups ($P = 0.138655$) (Table 1).

A higher prevalence of cirrhosis in the age group 41–60 years was recorded by us. Similar findings were reported by Grewal *et al.* (2018). We reported that 3:1 male-to-female ratio as followed by Grewal *et al.* (2018) and Singh *et al.* (2004) and also reported a higher incidence in males, that was, 4:1, 2.3:1 and, respectively. The mean age of the cirrhosis with viral associate patients studied was 41 years, which is comparable with the findings of Singh *et al.* (2004) and Grewal *et al.* (2018). Out of 66 cases, 49(74.2%) were

Table 1: Age group wise distribution of viral liver cirrhosis

Diagnosis	Age Group				Total
	0-20	21-40	41-60	Above 61	
Hepatitis C	02(4.9%)	11(26.8%)	22(53.7%)	06(14.6%)	41
Hepatitis B	02(9.1%)	13(59.1%)	04(18.2%)	03(13.6%)	22
Co-infection	-	01(33.3%)	02(66.7%)	-	03
Total	04(6.0%)	15(22.7%)	28(42.4%)	9(13.6%)	66

male and 17(25.8%) were female with male: female ratio 3:1. Among HCV, HBV and co-infection cases, male patients' prevalence was high compared to female patients (Table 2).

Table 2: Sex-wise distribution of viral liver cirrhosis

Diagnosis	Gender		Total
	Male	Female	
Hepatitis C	32(78%)	9(22%)	41
Hepatitis B	15 (68.2%)	07(31.8%)	22
Co-infection	02 (66.7%)	01(33.3%)	03
Total	49 (74.2%)	17(25.8%)	66

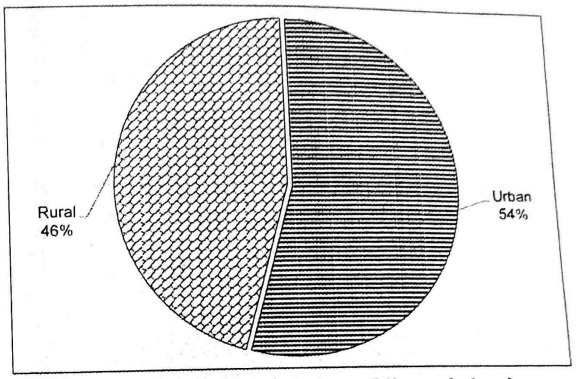

Figure 2: Area wise distribution of liver cirrhosis

In the present study, there was a significant gender difference in the study group; out of 66 viral liver cirrhosis cases 74.2% were male patients and 25.8% were female patients, compared with the others finding males were 80% and 20% were female by Grewal *et al.* (2018); 60.2% were male patients and 39.8% were females by Singh *et al.* (2020); Junejo *et al.* (2009); 67.5% for males and 32.5% for females and Agarwal *et al.* (2018); 67.4% for males and 32.6% for females, Omote *et al.* (2018); 61% for males and 39% for females.

Out of 66 liver cirrhosis cases, 36(54.5%) were from urban areas and 30(45.5%) were from rural areas (Figure 2).

CONCLUSION

The findings of the present study have revealed a remarkably high prevalence of viral infections among cirrhosis patients, with Hepatitis C infection being the predominant causative agent in our region. This aligns with previous research, although only a few studies have reported a high prevalence specifically in western Uttar Pradesh. It was observed that cirrhosis with viral hepatitis infection is more prevalent in males than in females. Furthermore, the highest incidence of hepatitis virus infection was found in the age group of 40-61 years, while the lowest incidence was observed in the age group of 0-20 years, particularly in urban areas. This study also highlights that co-infection of HBV and HCV is not a common occurrence. However, for a comprehensive understanding and confirmation of the impact of HCV and HBV co-infection on clinical outcomes, further research with larger sample sizes is warranted. Assessing the burden of HCV in cirrhosis is crucial, as these findings contribute to understanding shifts in care delivery patterns for HCV patients. This data provides essential insights into the scope of the issue and guides both clinicians and healthcare institutions

in developing protocols and strategies aimed at delivering timely and effective care to this particularly vulnerable group of patients affected by HCV and HBV.

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Mortality prediction by prognostic scoring in Hepatitis C- associated or non- associated cirrhotic patients

Ekta Rani
Ph.D., Research Scholar, Department of Microbiology, National Institute Of Medical Sciences & Research, Jaipur (Affiliated to NIMS University, Rajasthan), India
Orchid ID- 0000-0002-0892-5126
Corresponding author email: drekta21@gmail.com

Dr. Shama Tomar
M.D Microbiology, Professor & Head, Department of Microbiology, National Institute of Medical Sciences& Research, Jaipur (Affiliated to NIMS University, Rajasthan), India
Email: drshamt@yahoo.co.in

Dr. Shweta Sharma
M.D Medicine, Associate Professor, Department of Medicine, Lala Lajpat Rai Memorial Medical College, Meerut (Affiliated to Chaudhary Charan Singh University, Uttar Pradesh), India
Email: drshwetadhanveer@gmail.com

Dr. Swati Tewari
M.D Microbiology, Associate Professor, Department of Microbiology, National Capital Region Institute of Medical Sciences, Meerut (Affiliated to Chaudhary Charan Singh University, Uttar Pradesh), India
Email: drswatitewari@gmail.com

***Abstract*---Objectives:** Hepatitis C virus (HCV) is a hepatotropic virus that is one of the most common causes of liver disease and a potential cause of substantial morbidity and mortality worldwide. There is a paucity of data on the etiological profile of cirrhosis with HCV association in western Uttar Pradesh. **Methodology:** The observational type of study was carried out from June 2021 to May 2022 on patients attending in Medicine department at Lala Lajpat Rai Memorable Medical College, Meerut in collaboration with the Microbiology Department at National Capital Region Institute of Medical Sciences, Meerut, Uttar Pradesh, India. We included 247 patients who were diagnosed with cirrhosis, informed consent was taken with a 5 ml blood sample collected from each patient. The sample was screened

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for the qualitative detection of HCV-specific antibodies using 3rd generation Enzyme-linked immunosorbent assay (ELISA) from all the participants and Scored by the MELD score system. Result: A total of 247 confirmed cirrhosis patient's, 52 (21%), patients were positive with the association of HCV in the age group of 41-60 and the mean age was 50 years. The 31 (59.6%) were males, and 21 (40.3%) were females positive for HCV in the low-status family. Conclusion: In this study, the prevalence of HCV in cirrhosis patients was reported high in our region. The MELD-Na scores were a very good predictor of mortality at 3 months among patients with end-stage liver disease. Preventive measures are urgently required to control these factors to decrease morbidity and mortality.

Keywords---Blood borne infection, Cirrhosis, ELISA, Hepatitis C virus, MELD scoring, Prevalence.

I. Introduction

Hepatitis C virus (HCV) is a hepatotropic virus which is one of the major causes of liver disease and a potential cause of substantial morbidity and mortality worldwide. The virus, estimated to infect about 3% of the world population, is primarily transmitted via the parentral route which includes injection drug use, blood transfusion, unsafe injection practices, and other healthcare related procedures. HCV causes acute hepatitis which is mostly subclinical, but which gradually evolves into chronic hepatitis in about 80% of those infected.[1] HCV infected people are at risk for developing chronic liver disease (CLD), cirrhosis, and primary hepatocellular carcinoma (HCC). It has been estimated that HCV accounts for 27% of cirrhosis and 25% of HCC worldwide.[2]

An estimated 325 million people worldwide are living with hepatitis C virus (HCV) infection. The *WHO Global hepatitis report, 2017* indicates that the large majority of these people lack access to life-saving testing and treatment. As a result, millions of people are at risk of a slow progression to chronic liver disease, cancer, and death. Approximately 1.75 million people were newly infected with HCV in 2015, bringing the global total of people living with hepatitis C to 71 million.[3]The patients who develop chronic hepatitis C, after a gap of ten to twenty years may develop cirrhosis in 5-20 % of patients and around 25% of them can advance to End stage liver disease and hepatocellular carcinoma.[4]As no vaccine is available for hepatitis C, it is necessary to diagnose and treat the infected person after appropriate analysis.[5]

The standard & screening method of diagnosis is antibody detection by ELISA. Currently available, third generation immunoassay, which incorporates proteins from the core, NS3, and NS5 regions, detect anti-HCV antibodies during acute infection. This test has sensitivity of 97%. It detects antibodies within 6-8 weeks of infection i.e. during the initial phase of elevated aminotransferases activity.[6] The Model for End Stage Liver Disease (MELD) scoring system used in the allocation of liver transplants that has many advantages including objectivity, simplicity, ease of use, sensitivity to the dynamic changes of liver

reproducibility. According to Wiesner R et al, the study suggest that the MELD score is able to accurately predict 3-month mortality among patients with chronic liver disease on the liver waiting list and can be applied for allocation of donor livers. MELD-Na is the more specific compared to the MELD score.[7, 8] This study aims to give an overview of the viral infection in cirrhosis patients, their prevalence and diagnosis in tertiary care centre of Western Uttar Pradesh, India.

II. Materials & Methods

An prospective observational type of study was carried out from June 2021 to May 2022 on patients attending in Medicine department at LLRM Medical college Meerut in collaboration with Microbiology Department of NCRIMS, Meerut (Uttar Pradesh) India. We included 247 cirrhosis patient's in our study, an informed consent was taken from all the participants. The study had been approved by the ethical committee of research institute.5 ml blood sample was collected from each patients and serum was separated from the sample which was screened for qualitative detection of HCV-specific antibody by using 3rd generation ELISA assay. [5, 6]
Statistical analysis was done by software IBM SPSS STATISTICS 21.

Components of the MELD Score:

- **The MELD-Na score was calculates according to the formula:**
  $MELD_{(i)} = round^{1}[\ 0.378 * \log_e(bilirubin)) + (1.120*\log_e(INR)) + (0.957*\log_e(creatinine)) + 0.643\ ] * 10$
  [1] rounded to the tenth decimal place.
  $MELD = MELD_{(i)} + 1.32 * (137-Na) - [0.033*MELD_{(i)}*(137-Na)]$
- **The original MELD score was calculates according to the formula:**
  Original MELD Score= (0.957 * ln(Serum Cr) + 0.378 * ln(Serum Bilirubin) + 1.120* ln(INR) + 0.643) * 10 (if hemodialysis, value for creatinine is automatically set to 4.0)[8, 9]

Exclusion criteria include:

- Patients with any chronic liver disease other than HCV.
- Patients received liver transplantation before.

III. Result

A total of 247 confirmed cirrhosis patients' blood samples were included in the study. Out of these 52(21.0%), patients was associated with HCV. **(Fig.1)**

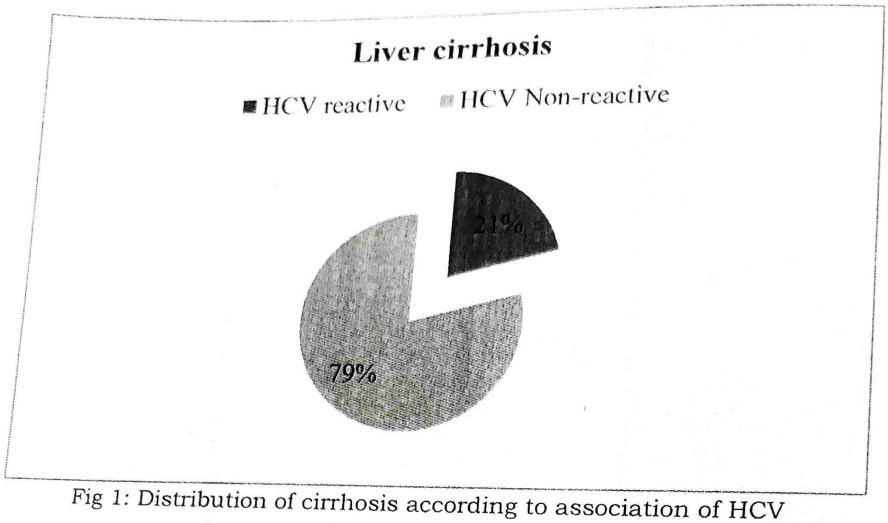

Fig 1: Distribution of cirrhosis according to association of HCV

Out of 52 HCV associated liver cirrhosis patients, 41-60 (44.23%) was the most common infected age group. Followed by 21-40 (38.46%), >61 (17.38%), and the 0-20 age group was not associate HCV with cirrhosis. The mean age was 45.9 (50) years.Among 52 patients, 31(59.61%) were males, and 21(40.38%) were females positive for HCV. The male: female ratio was 3.1:2.1.While we compare the family status of patients with HCV associate cirrhosis we found that 33 (63.46%) lower-class societiesis more prevalent compared to high and middle class status.Among 52 positive HCV-associated cirrhosis patients, Ascites 33 (63.46%) was the most common examination finding seen. Followed by the second most common examination findingwere Pedal Edema 09 (17.30%) and palpable Liver02 (3.84%). While 08 (15.38%) cases no such finding was there. (Table 1)

Table 1: Demographic characteristics of the patients with HCV Associated Cirrhosis

S. No.	Characteristics	HCV Positive N (%)
1.	Liver Cirrhosis (By ELISA)	52 (21.00%)
2.	Age	
	0-20	0 (0%)
	21-40	20 (38.46%)
	41-60	23 (44.23%)
	>61	09 (17.30%)
3.	Sex	
	Male	31 (59.61%)
	Female	21 (40.38%)
4.	Family status	
	High	09 (17.30%)

Lymphocytopenia was most consistent finding seen in patients (78.4%). Similar results were seen in study by Guan et al in which lymphocytopenia was present in 83.2% case. In study conducted by Agbuduwe et al most commonly blood count abnormality was lymphopenia noted in 35%-83% patients.[5,9,11,12] The white cell parameters are altered as a result of cytokine release syndrome and destruction of the T-lymphocyte leads to a bad clinical outcome. Inflammatory states of body triggers excessive yield of neutrophils and simultaneously bringing about apoptosis of lymphocytes thus proceeding towards immunological aberration. In one study in hospitalised COVID-19 patients in Singapore, the median ALC was significantly lower in patients requiring admission to ICU (0.4 vs 1.2 x10^9 /L) as was neutrophilia (11.6 vs 3.5 x10^9) /L). Another study involving 90 hospitalized COVID-19 patients reported an association between lymphopenia and disease severity.[13,14] In present study thrombocytopenia was seen in 354 patients(36.9%) which was in very close agreement with study by Guan et al showing 36.2% cases of thrombocytopenia. These hematological abnormalities were more prominent among severe vs non-severe cases and survivors versus non-survivors. These results were consistent in four other descriptive studies that were conducted in China and included 41,99,138 and 201 patients respectively. Thrombocytopenia common in viral infections, which might be explained by immunological platelet destruction, inappropriate platelet activation, consumption, and impaired megakaryopoiesis .Decreased platelet count, reflecting their consumption and thrombin generation, is helpful in recognizing the presence and severity of coagulopathy.[5,9,11,15] In the present study increased NLR was seen in 788(82.1%) patients the mean NLR was 4.2 in moderate disease versus 5.8 in severe disease and 3.86 in survivors versus 6.2 in non-survivors, the difference being statistically significant(P<.0001). Elevating NLR projects towards the prediction of mortality among sufferers of acute coronary syndrome, intracerebral hemorrhage, polymyositis, dermatomyositis, and cancers. It is a prominent predictor of severity of disease, high mortality and poor prognosis within patients of ICU. Normally, NLR should be below 3, but a ratio of above 3 signifies acute stress, and a ratio of more than 9 signifies sepsis. But variability occurs in populations regarding the cut-off value of NLR with some studies suggesting a cut-off value of 3, 3.5 and even 4. NLR, were found in COVID-19 patients and serve as useful indicators for diagnosis and predictive markers. PLR has also emerged as a potential tool for risk stratification in sepsis patients and a prognostic predictor in COVID-19 patients. Metaanalysis by Sarkal of various studies in literature showed deceased and critically ill patients had higher PLR correlating with more mortality and morbidity. In present study PLR was raised in severe disease and non-survivors group, as were seen by Man et al study. Another study from Wuhan revealed more severe cases having higher neutrophil counts, lower lymphocyte counts, higher NLR as well as lower percentages of monocytes, eosinophils and basophils.[19,25,26] Procalcitonin, serum ferritin, CRP, and interleukin-6 (IL-6) have been associated with high risks for severe COVID-19 infection . Regarding ferritin, Wu et al. showed that higher serum ferritin was associated with ARDS development, but the association with survival did not reach significance. Zhou et al. supported an association between higher serum ferritin levels and death.[15] In present study CRP was elevated in 834 patients(67.7%) Increased CRP correlation was seen to correlate well with clinical features, disease severity in COVID-19 patients. Higher CRP has been linked to unfavourable aspects of COVID-19 disease, such as ARDS development, myocardial injury, and death. Procalcitonin levels help in differentiating COVID-19 from sepsis in which the levels are increased, whereas in COVID19, the levels remain normal. Elevated procalcitonin which may also be suggestive of a secondary bacterial infection complicating the clinical course of COVID-19 disease, was found in 5.5%, and elevated lactate dehydrogenase (LDH) in 41% of patients. More severe cases showed a more marked increase compared with the moderate ones (81.5% vs 56.4% for CRP, 13.7% vs 3.7% for procalcitonin and 58.1% vs 37.2% for LDH). Accordingly in a retrospective cohort study including 191 patients with COVID-19 from Wuhan, China, non-survivors, as compared with survivors, presented more often with high LDH , high procalcitonin, increased serum ferritin levels and elevated IL-6. In the study by Wang et al, 40% of patients presented with elevated LDH. Increased LDH has been associated also with higher risk of ARDS, ICU support and death.[9,15,17]

CONCLUSION

Male gender, increasing age, Neutrophilia, Lymphocytopenia, Increased NLR and PLR are associated with grim prognosis in COVID-19 patients. Absolute neutrophil count, absolute lymphocyte count, neutrophil lymphocyte ratio(NLR) and platelet lymphocyte ratio(PLR), can independently, serve as reliable predictive and prognostic marker in COVID-19 disease.

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ORIGINAL ARTICLE

JIACM 2025; 26 (4): 181-85

Correlation of Neutrophil- to-Lymphocyte Ratio with Functional Ability in COPD Patients

Abha Gupta, Shweta Sharma*, Ansuk Shukla**, Santosh Mittal***, SKK Malik****, Seema Jain******

Abstract

Introduction: *Chronic Obstructive Pulmonary Disease (COPD) remains a leading cause of illness and death worldwide, especially in low- and middle-income countries like India. It is marked by chronic respiratory symptoms and progressive airflow obstruction. In recent years, systemic inflammation has gained recognition as a central factor in COPD progression. Among inflammatory markers, the neutrophil-to-lymphocyte ratio (NLR) has emerged as a potential indicator of disease severity and prognosis. This study aimed to evaluate the relationship between NLR and clinical, radiological, and functional parameters in patients with stable COPD.*

Methods: *A cross-sectional study was conducted at LLRM Medical College and SVBP Hospital, Meerut, during 2023 – 2024. Sixty-one stable COPD patients aged 35 years or older were enrolled based on post-bronchodilator $FEV_1/FVC < 70\%$ and absence of exacerbation in the prior two months. All patients underwent clinical assessment, spirometry, six-minute walk test (6MWT), chest imaging, and laboratory tests including complete blood count and CRP. NLR was calculated and correlated with clinical indices, GOLD stage, and BODE index.*

Results: *The mean age was 64.2 years, and 72% were male. The average NLR was 4.36. Most patients were in GOLD 3 category. NLR showed a negative correlation with FEV_1, FEV_1/FVC, 6MWT distance, and SpO_2 and a positive correlation with CRP and BODE index. NLR levels increased consistently with GOLD stage ($p < 0.001$).*

Conclusion: *NLR appears to be a simple, cost-effective marker that correlates well with COPD severity and functional decline. It may aid in risk stratification and clinical decision-making.*

Key words: Chronic obstructive pulmonary disease, neutrophil-to-lymphocyte ratio.

INAL ARTICLE

inicopsychological Profile of Geriatrics Patient Visiting the Outpatient Department of a Tertiary Care Center of Western Uttar Pradesh: A Cross-sectional Study

Shweta Sharma[1], Abha Gupta[2], Garima Chaudhary[3*], Vivek K Rishi[4], Tarun Pal[5]

Received: 04 May 2025; *Accepted:* 16 July 2025

Abstract

Background: The geriatric population is highly vulnerable to both clinical and psychological comorbidities; the psychological health of geriatric patients remains underassessed, particularly in government outpatient department (OPD) settings where multiple chronic illnesses, low socioeconomic status, and hospitalization disrupt emotional well-being.

Aims and objectives: To evaluate the prevalence and association of chronic diseases with depression, anxiety, cognitive impairment, and sleep quality in elderly patients.

Materials and methods: A cross-sectional study was conducted on 100 patients aged ≥60 years attending the medicine OPD. Geriatric depression scale (GDS-15), generalized anxiety disorder scale (GAD-7), mini-mental state examination (MMSE), and Pittsburgh sleep quality index (PSQI) scales were used to assess psychological status. Clinical parameters and recent hospitalization history were also recorded.

Results: Hypertension (45%), diabetes (35%), and osteoarthritis (25%) were the most prevalent chronic illnesses. Mild depression (56%), mild anxiety (45%), cognitive impairment (45%), and poor sleep quality (78%) were common. Coronary artery disease (CAD) was significantly correlated with depression ($p = 0.008$), diabetes with cognitive decline ($p = 0.002$), and recent hospitalization with cognitive scores ($p = 0.006$).

Conclusion: The study underscores the need for integrated psychological assessment and intervention in geriatric medicine, even in resource-constrained OPD environments. Chronic illnesses such as CAD and diabetes significantly affect psychological well-being in elderly patients. Routine psychological screening is essential in OPDs.

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Introduction

The geriatric population represents a rapidly growing segment in India, presenting with increasing rates of multimorbidity. Often, psychological disorders such as depression, anxiety, cognitive impairment, and poor sleep remain unrecognized in outpatient settings. These undiagnosed issues significantly impair quality of life and treatment compliance. This study evaluates the psychological profile of elderly patients and explores correlations with chronic medical illnesses in a government hospital setting.

Aims and Objectives

- To determine the prevalence of depression, anxiety, cognitive impairment, and poor sleep quality in geriatric patients.
- To assess the correlation between chronic diseases [e.g., coronary artery disease (CAD), diabetes] and psychological conditions.
- To evaluate the impact of recent hospitalization on psychological health in elderly outpatient department (OPD) attendees.

Materials and Methods

This cross-sectional study was conducted at the medicine OPD of SVBP Hospital, Lala Lajpat Rai Memorial Medical College, Meerut. A total of 100 geriatric patients aged 60 years or above were recruited.

Inclusion Criteria

Patients aged ≥60 years, attending the medicine OPD, willing to participate.

Exclusion Criteria

Patients with diagnosed psychiatric illness or terminal illness.

Assessment Tools

- Geriatric depression scale (GDS-15).[1]
- Generalized anxiety disorder scale (GAD-7).[2]
- Mini-mental state examination (MMSE).[3]
- Pittsburgh sleep quality index (PSQI).[4]

Demographic, clinical, and hospitalization history was recorded. Statistical tests included Pearson correlation and Chi-square.

Observations and Results

As shown in Table 1, hypertension, diabetes, and osteoarthritis were the most common chronic illnesses.

Table 2 shows that mild depressive symptoms were reported by 56% of participants, while moderate depression was seen in only 1%. This indicates a high prevalence of subclinical emotional distress in geriatric OPD patients, with no severe depression

Table 1: Prevalence of chronic diseases among participants

Chronic illness	*Patients (n)*	*Percentage (%)*
Hypertension	45	45
Diabetes mellitus	35	35
Anemia	27	27
COPD/asthma	25	25
Osteoarthritis	25	25
CAD	20	20
CKD	15	15
Stroke	15	15
Tuberculosis	5	5
Chronic liver disease	5	5
Cancer	1	1

[1]Professor, Department of Internal Medicine; [2]Professor; [3]Junior Resident; [4]Assistant Professor, Department of Medicine; [5]Associate Professor, Department of Psychiatry, Lala Lajpat Rai Memorial Medical College, Meerut, Uttar Pradesh, India; *Corresponding Author

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tal health follow-up postdischarge, shown by Sachdev et al.[8] Although conditions like chronic kidney disease (CKD), stroke, and chronic obstructive pulmonary disease (COPD) showed weak or nonsignificant associations, these trends warrant further exploration in larger studies.

Our results echo national surveys such as WHO-SAGE[9] and NMHS,[10] which indicate a high burden of undiagnosed mental health issues in the elderly. The high prevalence of mild depression, anxiety, cognitive impairment, and poor sleep—evident across Tables 2 to 5—reinforces the urgent need for routine psychological screening in geriatric medicine.

In summary, this study supports the growing body of evidence calling for mental health integration into geriatric care. Addressing psychological concerns is not merely beneficial for quality of life; it enhances compliance, reduces hospitalizations, and improves overall clinical outcomes. Even resource-constrained OPD settings can deliver meaningful geriatric mental healthcare through simple, validated screening tools and integrated care pathways.

Conclusion

This cross-sectional study highlights the significant association between chronic medical illnesses and psychological impairment among the elderly. CAD and diabetes were strongly linked with depression and cognitive decline, respectively, while recent hospitalization emerged as a predictor of poorer cognitive and sleep health. The study supports integrating brief psychological screening tools into daily geriatric OPD practice to improve early diagnosis and holistic management.

Comparison with Previous Studies

Several studies conducted in India and globally have examined the interplay between chronic illnesses and psychological distress in the elderly.

In a large-scale study based on the Longitudinal Aging Study in India (LASI[11]), Ansari et al.[11] reported a strong correlation between multimorbidity and depression in older adults. Our findings align partially, especially in the context of diabetes and stroke correlating with depression and cognitive impairment.

Tiwari and Pandey[12] noted a high prevalence of psychological morbidity, particularly depression, in Indian elderly with chronic illnesses, similar to the high percentage of mild-to-moderate depression found in our sample.

Recommendations

Routine Screening

Implement brief, validated tools (GDS-5[4], GAD-7[1], MMSE[2], PSQI[3]) in geriatric OPDs to detect depression, anxiety, cognitive decline, and poor sleep.

Integrated Care Approach

Promote multidisciplinary teams or liaison models (physician + mental health professional) even in low-resource OPDs for holistic elderly care.

Evidence-based Management

Treat psychological issues using psychoeducation, cognitive behavioral therapy (CBT), sleep hygiene, and, where needed, age-appropriate medications (SSRIs, melatonin). Monitor regularly.

Optimize Physical Health

Control chronic diseases aggressively. Use lifestyle changes, like exercise, to improve both physical and mental health outcomes.

Strengthen Social Support

Address loneliness. Connect elders to senior clubs, nongovernmental organizations (NGOs), and community groups. Involve family in care plans and support caregivers.

Leverage National Programs

Align with India's National Program for Health Care of the Elderly (NPHCE) and District Mental Health Program (DMHP) for training, referrals, and access to geriatric psychiatry services. Use WHO-mhGAP protocols in primary care.

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ORIGINAL ARTICLE JIACM 2024; 25 (4): 177-80

Prevalence of Hepatitis C Infection among Patients of Chronic Kidney Disease in a Tertiary Care Hospital of Western Uttar Pradesh

Abha Gupta, Shweta Sharma**, Anupam Nirala****

Abstract

Introduction: *Chronic kidney disease (CKD) and Hepatitis C, both are menacing public health problems, Hepatitis C virus (HCV) can easily be transmitted via haemodialysis. HCV leads to greater mortality and morbidity due to cirrhosis, while also increasing the progression of CKD. The aim of this study was to determine the prevalence of HCV infection among patients of CKD.*

Methods: *It was a cross-sectional study of CKD patients who were admitted in Medicine department in LLRM Medical College, Meerut, which is a tertiary care center in Western UP. Proper clinical history and laboratory investigations were noted and testing for HCV infection was conducted in all patients. Diagnosis of HCV was confirmed by HCV RNA (RT PCR) and positive Anti HCV IgG antibody.*

Results: *Total 146 patients of CKD were included in the study out of which 54.50% were males and 44.50% were females. Most of the patients were in age group 35 - 50 years (52.05%). Our study showed prevalence of HCV in CKD patients to be about 6.84% with male predominance.*

Conclusions: *Prevalence of HCV infection in CKD patients is high as compared to the general population. Screening for HCV with HCV RNA (RT PCR) is recommended. Strict precautions should be taken in hospitals and dialysis units to prevent it's transmission.*

Key words: *Chronic kidney disease, prevalence, Hepatitis C.*

Introduction

Currently India has around 10 - 15 million people infected with Hepatitis C virus (HCV) with a prevalence of 0.5 - 1.5%[1]. In renal replacement therapy units, HCV infection is a significant cause of morbidity and mortality among haemodialysis (HD) patients, and management of such patients becomes complicated in view of HCV infection. The prevalence of HCV among dialysis patients in India is reported to range between 10% and 40%[2-7].

For patients with severe renal impairment, acute renal failure, and stage IV chronic kidney disease, HD is a simulated way of maintaining homeostasis in the body. Many patients undergo dialysis for prolonged periods of time and are exposed to various side-effects as a consequence of dialysis. The spread of HCV to patients on HD is generally hospital acquired and potential risk factors include failure to disinfect devices, sharing of single-use vials for infusion, improper techniques, contaminated dialysis equipment, and supplies, contamination by attending personnel. However, long-standing vascular exposure and manifold blood transfusions also increases the risk.

The aim of these study was to estimate the prevalence of Hepatitis C infection among patients of CKD and to compare the prevalence of HCV infection in CKD patients on maintenance HD with those CKD patients not on maintenance HD.

Material and Methods

The study was conducted in SVBP Hospital, Meerut, (UP) during the period of one year. It was cross-sectional, single centre study.

All cases in the study were admitted in the hospital and evaluated for hepatitis C infection. The study included consenting adult patients of CKD and excluded CKD patients who had any haematological disorder or HIV infection.

A questionnaire was made to ensure proper data collection. The data collected included age, sex, occupation, duration of haemodialysis, number of blood units transfused, history of hypertension or diabetes mellitus.

1. Cut-off for CKD was defined as:

   GFR (eGFR) less than 60 mL/min/1.73 m^2 (GFR category G3a - G5) or,

   Persistent proteinuria by urinary dipstick for 3 months or more[8].

2. eGFR was calculated by CKD-EPI creatinine equation

**Professor and Head, **Professor, ***Junior Resident, Department of Medicine, LLRM Medical College, Meerut - 250 004, Uttar Pradesh.*

Corresponding Author: Dr Anupam Nirala, Junior Resident, Department of Medicine, LLRM Medical College, Meerut - 250 004, Uttar Pradesh. Tel: 6396253792, E-mail: abha.gupta11@yahoo.com

ORIGINAL ARTICLE

JIACM 2025; 26 (1-2): 7-12

Clinico-Pathological Profile of Anaemia in Adult Males at a Hospital in Uttar Pradesh

Shweta Sharma, Abha Gupta*, Remesh Rajappan**, Chhaya Mittal***, Anshu Singh*****

Abstract

Introduction: *Every fourth person in the world (27%) has anaemia, with developing countries alone accounting for more than 89% of the burden. Population-based studies on anaemia in India have mostly focused on women and children, with men anaemia receiving much less attention despite anaemia having adverse effect on their health, wellbeing, and economic productivity.*

Aims and objectives: *To study the various determinants and co-morbid conditions associated with anemia in males aged 18 - 49 years.*

Methods: *A cross-sectional study on anaemic male patients aged 18 - 49 years attending SVBP Hospital, Meerut, Uttar Pradesh.*

Results: *Majority of participants belonged to the 46 - 49 years age group. Nutritional issues were the most prevalent condition, affecting 43.08% of patients. Chronic liver disease (CLD) followed, with a prevalence of 20.0%. Our study revealed a notable association between co-morbid conditions and the severity of anaemia.*

Conclusion: *Anaemia in adult males is intricate and multifaceted, necessitating personalised interventions.*

Key words: *Anaemia in males, anaemia severity, co-morbidities in anaemia.*

Introduction

Anaemia is a condition in which the number of red blood cells or the haemoglobin concentration within them is lower than normal. The optimal haemoglobin concentration needed to meet physiologic needs varies by age, sex, altitude of residence, smoking habits and pregnancy status. WHO defines anaemia in children aged under 5 years and pregnant women as a haemoglobin concentration <11 g/dL at sea level, and anaemia in non-pregnant women as a haemoglobin concentration <12 g/dL and in males as <13g/dL. Anaemia is further classified depending upon the level of Hb into mild (Hb 11 - 12.9 g/dL), moderate (Hb 8 - 10.9 g/dL) and severe (Hb <8 g/dL)[1]. Every fourth person in the world (27%) has anaemia, with the developing countries alone accounting for more than 89% of the burden[2].

According to NFHS-5 survey, fifty-seven per cent of women and 25 per cent of men age 15 - 49 years have anaemia in India[3]. Anaemia is an important global health problem affecting men and women of reproductive age group. Various factors contribute to the prevalence of anaemia in males, encompassing socio-economic conditions, health status, behavioural factors and more (Fig. 1). These determinants collectively influence the likelihood of an individual developing anaemia and underscore the multifaceted nature of this health condition. Population-based studies on anaemia in India have mostly focused on women and children, with men with anaemia receiving much less attention despite anaemia having adverse effect on their health, wellbeing, and economic productivity[4].

Aim and Objectives

1. To study various aetiologies of anaemia in males aged 18 - 49 years attending a tertiary care hospital in Western Uttar Pradesh.
2. To study co-morbid conditions associated with anaemia in these adult males.

Material and Methods

This was a cross-sectional study of anaemic male patients attending SVBP Hospital, Meerut. During the study period of 3 months from 2023 May to 2023 July, in which all eligible patients who visited Medicine OPD were included in this study. So a sample size of of 65 patients was selected for study . Clinically, biochemically, and pathologically, all patients were evaluated. All male anaemic patients aged 18 - 49 years attending SVBP Hospital were interviewed using a pre-designed and pre-tested questionnaire. Relevant

**Professor, **Junior Resident, Department of Medicine, ***Associate Professor, Department of Community Medicine, ***Assistant Professor, Department of Pathology, LLRM Medical College, Meerut - 252 002, Uttar Pradesh.*
Corresponding Author: Dr Remesh Rajappan, Junior Resident, Department of Medicine, LLRM Medical College, Meerut - 252 002, Uttar Pradesh. Tel: 6238365719, E-mail: remeshrajappan123@gmail.com

ORIGINAL ARTICLE

A Study of Association of Insulin Resistance with Pregnancy-induced Hypertension

Abha Gupta[1], Shweta Sharma[2], Kirti Dubey[3], Vineet Dixit[4*]

Received: 29 August 2023; *Accepted:* 13 March 2024

Abstract

Background: Preeclampsia is one of the important causes of maternal and fetal mortality and morbidity. One of the important risk factors for the development of diabetes is insulin resistance (IR).

Aims: To evaluate the association of IR with pregnancy-induced hypertension (PIH) and its severity.

Materials and methods: Data from 70 pregnant females who had completed 20 weeks of gestation and developed PIH were analyzed and compared with 30 appropriate controls. All females underwent measurement of fasting glucose level, fasting insulin level, and blood pressure.

Results: The mean age of the women in the control group was 26.17 years, and in the study group, it was 27.09 years. All females had completed 20 weeks of gestation. Around 86.6% of women in the control group, 54.1% with a variable degree of preeclampsia, and 48.6% of women with eclampsia were at 33–38 weeks of gestation. At the time of sampling, 13.3% of women in the control group, 45.81% of women with preeclampsia, and 51.3% of women with eclampsia were at 26–32 weeks of gestation. The mean IR among the control group was 1.37, in preeclampsia, it was 2.11, and in eclampsia, it was 3.58 with a *p*-value of 0.000, which is very highly significant. In this study, the severity of the disease was found to be directly proportional to IR.

Conclusion: Pregnancy complicated with preeclampsia and eclampsia showed more IR in comparison to pregnant women with normal blood pressure, and this relationship is independent of the age of pregnant women.

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Introduction

Adaptation to a sedentary lifestyle and high-calorie, saturated fat, and high-sodium-containing food intake has resulted in a higher incidence of hypertension, obesity, and insulin resistance (IR) nowadays. IR is related to a high-risk of cardiovascular disease and various metabolic abnormalities even without obesity and type 2 diabetes.[1]

A rapid, cost-effective, and easy method for diagnosing IR is homeostasis model assessment of insulin resistance (HOMA-IR).[2]

The etiology of pregnancy-induced hypertension (PIH) is multifactorial, and some hypotheses related to etiopathogenesis have been explored and are as follows[3]:

- Abnormal trophoblastic invasion and placental ischemia.
- Immune-mediated factors.
- Genomic imprinting.
- Nutritional factors.
- Inflammatory and vascular changes due to maternal maladaptation.

It is a dynamic process with central components like vasospasm, increased pressor response, uteroplacental insufficiency, and hematological changes adding to the pathogenesis of PIH. PIH leads to adverse fetal and maternal outcomes like low birth weight, increased risk of cardiovascular mortality, and eclampsia.[4]

Aims and Objectives of This Study

- The primary aim of this study was to study the level of IR in patients with preeclampsia and eclampsia.
- The primary goal is to set a correlation between preeclampsia/eclampsia and IR and to evaluate any clinical application of such correlation.

Materials and Methods

The study was conducted at LLRM Medical College, Meerut, Uttar Pradesh, India. Patients from the medicine/gynecological outpatient department (OPD) and inpatient department (IPD) were selected randomly into three groups as per the National High Blood Pressure Education Program (NHBPEP) Working Group guidelines.

Inclusion Criteria

Pregnant females aged over 18 years who had completed 20 weeks of gestation and were diagnosed with preeclampsia or eclampsia were included in the study.

Exclusion Criteria

All females with diabetes mellitus, chronic kidney disease (CKD), or autoimmune rheumatoid (AR) disease, undergoing treatment for diabetes mellitus, thyroid disease, females with acute infections, and pregnant females with preexisting hypertension were excluded from the study.

Measurement of Hypertension

In this study, pregnant women were diagnosed with PIH if two blood pressure readings of 140/90 mm Hg or greater were noted at least 4 hours apart. Blood pressure was measured in the right arm at the level of the heart with an appropriately sized cuff. Before the blood pressure measurement, the patient was made to sit and given a chance to rest for at least 10 minutes.

Detailed histories of any medication for hypertension were taken. The average systolic blood pressure (SBP) and diastolic blood pressure (DBP) were calculated as the average of three consecutive measurements. Hypertension was defined as per the American College of Obstetricians and Gynecologists (ACOG) guidelines, with SBP of 140 mm Hg and above or DBP of 90 mm Hg and above.

Measurement of Proteinuria

Almost 24-hour urine collection was conducted to diagnose proteinuria, with a value greater than 300 mg/24 hours considered significant.

Insulin Resistance

The HOMA-IR index (insulin μU/mL × glycemia mmol/L/22.5) was used to quantify IR. All participants in the study group were subjected to the measurement of body mass index (BMI), hemoglobin A1c (HbA1c), insulin levels, fasting blood sugar, complete hemogram, liver function test (LFT), kidney function test (KFT), fasting lipid profile (FLP), 24-hour urinary protein, and ultrasonography.

All the data was compiled and analyzed by applying appropriate statistical tests.

[1]Professor and Head; [2]Professor, Department of Medicine; [3]Ex Professor, Department of Obstetrics and Gynecology; [4]Senior Resident, Department of Medicine, LLRM Medical College, Meerut, Uttar Pradesh, India; *Corresponding Author

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