Hepatitis C is an ailment of the liver, brought about by a viral infection (hepatitis C virus - HCV). The infection is transmitted via bodily fluids and blood in particular. Though unprotected sexual contact poses a risk, little evidence of sexual transmission is available. The condition is asymptomatic for a brief initial period, followed by vague symptoms such as low fever, yellow skin, dark urine etc. Thus, the condition is hard to notice in the initial stage, with people become aware of their ailment and attaining a diagnosis late in the infection – all the while acting as carriers and transmitting the infection forward. HCV infection has a mortality rate of 1%, with the morbidity (liver cancer and cirrhosis) rate being much higher [1,2]. More than 10 million people in Pakistan are afflicted with the condition, entailin a high morbidity and mortality. According to a comprehensive systematic review (based on literature published from 1994 to 2009), prevalence of HCV was (4.95%± 0.53%) in the general adult population, (1.72%± 0.24%) in the pediatric population and (3.64%± 0.31%) in a young population, whereas a very high (57%± 17.7%) prevalence was observed in injecting drug users and (48.67%± 1.75%) in a multi-transfused population [3-5].

**Evaluation of Tumor Markers Among Patients with Hepatitis C Infection**

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**ABSTRACT**

Tumor markers are biomolecules found in blood, urine and tissue of individuals and, with particularly high concentration in most cancers, therefore, their concentration has diagnostic value. These markers may be used for screening, identification(type and stage), monitoring, and predicting prognosis. Increases in tumor markers are sometimes seen in patients with chronic liver disease without hepatocellular carcinoma (HCC). **Objective:** To determine the tumor markers, present among patients with Hepatitis C Infection. **Methods:** From April 2021 to March 2022, serum samples from 700 HCV patients who presented to the Department of Pathology at the Pir Syed Abdul Qadir Shah Jeelani Institute of Medical Sciences, Gambat Khairpur Mirs, were used in this descriptive, cross-sectional study. Using the ACCESS-2 system, serum samples were analyzed for the presence of the specified tumor markers. **Results:** There was a significant increase in CA125 (P = 0.03) and AFP levels (P = 0.03). CA19-9, CEA, and CA15-3 levels in the blood were unremarkable (P > 0.05). It is too early to say if the increase in CA125 or AFP will lead to eventual carcinoma based on this study, but it deserves further exploration using a longitudinal research methodology. **Conclusion:** CA125 and AF (P were the most common tumor markers found in HCV patients. Given the association of the aforementioned indicators with hepatic cancer, HCV patients with CA125 and AFP levels over normal should be considered high-risk.

**INTRODUCTION**

Hepatitis C is an ailment of the liver, brought about by a viral infection (hepatitis C virus - HCV). The infection is transmitted via bodily fluids and blood in particular. Though unprotected sexual contact poses a risk, little evidence of sexual transmission is available. The condition is asymptomatic for a brief initial period, followed by vague symptoms such as low fever, yellow skin, dark urine etc. Thus, the condition is hard to notice in the initial stage, with people become aware of their ailment and attaining a diagnosis late in the infection – all the while acting as carriers and transmitting the infection forward. HCV infection has a mortality rate of 1%, with the morbidity (liver cancer and cirrhosis) rate being much higher [1,2]. More than 10 million people in Pakistan are afflicted with the condition, entailing a high morbidity and mortality. According to a comprehensive systematic review (based on literature published from 1994 to 2009), prevalence of HCV was (4.95%± 0.53%) in the general adult population, (1.72%± 0.24%) in the pediatric population and (3.64%± 0.31%) in a young population, whereas a very high (57%± 17.7%) prevalence was observed in injecting drug users and (48.67%± 1.75%) in a multi-transfused population [3-5]. Tumor markers are biomolecules found in blood, urine and tissue of individuals and, with particularly high...
CA19-9 is elevated among patients with cancer of the lungs, hepatocellular carcinoma, the serum concentration of 35 U/ml. In addition to healthy and disease (cancerous) cases is a serum monoclonal antibody. The point of differentiation between healthy and diseased (cancerous) individuals is a concentration is 25 U/ml for CA15-3. The marker is primarily a carbohydrate antigen that can be found in up to 80% of non-glycoprotein (molecular weight: >200 kDa) marker is a carbohydrate-related high molecular mass glycoprotein (molecular weight: >200 kDa) marker is a carbohydrate antigen that can be found in up to 80% of non-mucinous ovarian cancer cases. The marker is primarily a monoclonal antibody. The point of differentiation between healthy and disease (cancerous) cases is a serum concentration of an upwards of 35 U/ml. In addition to hepatocellular carcinoma, the serum concentration of CA125 is elevated among patients with cancer of the lungs, endometrium, pancreas, breast, and colon [13,14]. CEA: This antigen is an oncofetal antigen that is linked to a wide group of cell surface glycoproteins (molecular weight: 150–300 kDa) that are found on numerous cell types but have much higher concentrations in tumour patients and fetuses (normal). Smokers and nonsmokers have various points of differentiation (between normal and ill persons), namely 2.5g/l and 5.0g/l, respectively.

METHODS
This descriptive, cross-sectional study was conducted from April 2021 to March 2022 using serum samples of 700 HCV patients, presenting to the Dept. of Pathology at Pir Syed Abdul Qadir Shah Jeelani Institute of Medical Sciences, Gambat, Khairpur Mirs. The serum samples were checked for the existence of the listed tumor markers by ELISA using ACCESS-2 machine. ACCESS-2 can identify the following prominent biomarkers, among others. Since the levels (obtained via biochemical tests) of biomarkers can vary with time and between patients, the principles of best practice state that an arithmetic mean be used. Inclusion criteria was confirmed cases of HCV. Exclusion criteria was patients receiving hepatitis medication / Antiviral Therapy. Interferon-alpha (Subcutaneous Inj.) in combination oral Ribavirin & Lamivudine. Proven cases of hepatocellular carcinoma (HCC).

RESULTS
The mean age of the sample stood at 43 (SD±3) years, with most of the sample comprising of males (59.29%) and the remaining being females (40.71%). Patients (73.14%) hailed from an urban setting while the remaining had a rural (26.86%) residence. A summary of the sociodemographic characteristics of the sample population are tabulated below. An increase in CA125 and AFP levels, was noted. Levels (in serum) of tumor marker CA15-3, CA19-9, and CEA were unremarkable.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Statistic – n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td></td>
</tr>
<tr>
<td>Up to 20</td>
<td>92 (13.14%)</td>
</tr>
<tr>
<td>21 to 30</td>
<td>103 (14.71%)</td>
</tr>
<tr>
<td>31 to 40</td>
<td>175 (25.5%)</td>
</tr>
<tr>
<td>41 to 50</td>
<td>161 (23.3%)</td>
</tr>
<tr>
<td>51 and above</td>
<td>94 (13.43%)</td>
</tr>
<tr>
<td>41 to 45</td>
<td>75 (10.72%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>415 (59.29%)</td>
</tr>
<tr>
<td>Female</td>
<td>285 (40.71%)</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>512 (73.14%)</td>
</tr>
<tr>
<td>Rural</td>
<td>198 (26.86%)</td>
</tr>
<tr>
<td>Educational Status</td>
<td></td>
</tr>
<tr>
<td>Educated</td>
<td>404 (57.71%)</td>
</tr>
<tr>
<td>Un-Educated</td>
<td>296 (42.29%)</td>
</tr>
</tbody>
</table>
DISCUSSION

A variety of markers are used for HCC and among the said markers is serum alpha-fetoprotein (AFP), which is used widely and with great effect. However, it is noted that serum AFP levels are oftentimes increased among patients with ailments of the liver other than HCC. The same conditions may also infect patients concurrently with HCV in up to 42% of the cases, putting the specificity of AFP (with regards to HCC) into doubt [15]. In this research, an 85% of the sample population had a raised AFP level. Research suggests that the hiked levels of AFP result from hepatocyte destruction (due to viral hepatitis) and consequent attempts of regeneration [16]. Recently, more alternatives have surfaced that outperform AFP in terms of specificity for HCC, [17] such as the “Lens culinaris agglutinin-reactive fraction of AFP (AFP-L3%)” [12] and “des-carboxy prothrombin (DCP)” [18]. The Access-2 machine used in this research does not measure the said markers, with hepatitis B virus being less efficacious for purposes pertaining to management of the disease condition [25]. This study did have a few limitations. Firstly, it was a single center study and although the setting played host to a diverse demographic cohort, it is still a possibility that the results may not be truly generalizable to the general population. Nonetheless, care was exercised in extrapolating the study findings to other populations.

CONCLUSIONS

After careful consideration and a thorough evaluation, CA125 and AFP were the prominent tumor markers detected among patients with hepatitis C. Keeping in view the co-occurrence of the said markers with hepatic carcinoma, it is advised that hepatitis C patients with CA125 and AFP levels above normal may be treated as high-risk patients.

REFERENCES


