Gut microbiota associated with the global burden of gallbladder carcinoma

**Background**
Little is known about the relationship between alteration of gut microbiota and the sensitivity of hepatocellular carcinoma (HCC) to sorafenib. We performed a comparative study of gut microbiota composition between sorafenib-resistant HCC patients (R group, n=10) and sorafenib-sensitive HCC patients (S group, n=10).

**Methods**
Twenty patients were classified into two groups based on the sensitivity of hepatocellular carcinoma to sorafenib within 12 months of post-sorafenib treatment. Treatment response was assessed using modified response evaluation criteria in solid tumors (mRECIST) criteria. After sorafenib treatment, the fecal samples were analyzed using 16S rRNA gene sequencing and LC-MS-based metabolomics approach.

**Results**
Compared with the R group, significant gut microbiota alterations were associated with the sensitivity of HCC to sorafenib. The results showed that the S group had higher Faecalibacterium, Enterococcus and Veillonella abundance while the R group had higher levels of Lactobacillus and Prevotellaceae. Additionally, the S group had a higher bacterial network complexity compared with the R group. Moreover, both Salbutamol and Glycopyramide correlated positively with Anaerostipes.

**Conclusions**
These observations will lead to a better understanding of the relationship between alteration of gut microbiota and the sensitivity of HCC to sorafenib. Gut microbiota and microbe-associated metabolites can be used as diagnostic biomarkers in therapeutic explorations.

**Abstract IDDF2020-ABS-0103 Table 1**
Objective responses and disease control rates between two groups per the RECIST v1.1 and imRECIST.

<table>
<thead>
<tr>
<th></th>
<th>RECIST v1.1</th>
<th>imRECIST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>NR</td>
</tr>
<tr>
<td>PVTT group (n=16)</td>
<td>16(100)</td>
<td>5(31.2)</td>
</tr>
<tr>
<td>Non-PVTT (n=34)</td>
<td>4(11.8)</td>
<td>30(88.2)</td>
</tr>
<tr>
<td>p value</td>
<td>p=0.383</td>
<td>p=0.125</td>
</tr>
</tbody>
</table>

**Abstract IDDF2020-ABS-0103 Figure 1**
Significantly better overall survival rates were observed in the patients without portal vein tumor thrombus (PVTT) (p = 0.018)

**Abstract IDDF2020-ABS-0117**
Gut microbiota associated with the sensitivity of hepatocellular carcinoma to sorafenib

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**Gut 2020;**

**Background**
This study aimed to evaluate the global incidence, mortality of gallbladder cancer, and their associations with human development index (HDI), gross domestic products (GDP), smoking, alcohol drinking, and overweight for 180 countries.

**Methods**
The regional and national incidence and mortality figures for gallbladder cancer in 2018 were retrieved from the GLOBALCAN database. Age-standardized rates (ASRs) were evaluated by the Segi–Doll world standard population. HDI

**Abstract IDDF2020-ABS-0139**
Global burden of gallbladder cancer and its associations with HDI, GDP, smoking, alcohol drinking, and overweight

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**Abstract IDDF2020-ABS-0117**
Gut microbiota associated with the sensitivity of hepatocellular carcinoma to sorafenib

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and GDP per capita in 2018 for each country were collected from the United Nation and World Bank. Prevalence of smoking, alcohol drinking, and overweight in 2010 was retrieved from the Global Health Observatory. The association between the incidence/mortality and these factors was examined by Pearson’s correlation coefficient (r).

Results The global ASR of the incidence of gallbladder cancer was 2.3 per 100,000 persons in 2018. The highest rates were reported in Eastern Asia (ASR=3.0), whilst the lowest rates were found in Middle Africa (0.35). The incidence was the highest in countries with very high HDI (2.5) as compared to those with high (2.4), medium (2.0), and low HDI (0.55).

Abstract IDDF2020-ABS-0139 Figure 1  The correlation between HDI, GDI, smoking, alcohol drinking, overweight, and gallbladder cancer incidence and mortality
Countries with higher incidence were correlated with higher HDI ($r=0.31$, $p<0.001$) and a higher prevalence of smoking (0.26, 0.005) and overweight (0.20, 0.011, figure 1). The global ASR of mortality was 1.7. The highest rates were reported in Eastern Asia (ASR=2.4), whilst the lowest rates were found in Middle Africa (0.29). The mortality was the highest in countries with high HDI (1.9) as compared to those with very high (1.5), medium (1.5), and low HDI (0.45). Countries with higher mortality were correlated with higher HDI ($r=0.22$, $p=0.005$) and a higher prevalence of smoking (0.27, 0.003). No correlations with GDP or alcohol drinking were found ($p>0.05$).

**Conclusions**

Higher incidence and mortality of gallbladder cancer were found in regions with higher HDI, higher prevalence of smoking and overweight. With population aging and growth, we might expect a further substantial increase in its disease burden, especially for countries with high socioeconomic development. Preventive interventions on reducing the prevalence of risk factors for gallbladder cancer are warranted.

**Abstract IDDF2020-ABS-0156**

**ASSOCIATION BETWEEN INCIDENCE AND RISK FACTORS OF LIVER CANCER: A GLOBAL COUNTRY-LEVEL ANALYSIS**

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**Background**

Liver cancer is the sixth most common cancer and the fourth leading cause of cancer mortality globally. The global ASR of incidence of liver cancer was 9.3 per 100,000 persons in 2018. There was an estimated total of 471,000 and 168,200 new cases of liver cancer attributable to HBV and HCV in 2018, respectively. This study aimed to evaluate the association between incidence of liver cancer and its risk factors among 185 countries.

**Methods**

The age-standardised rates (ASR) for incidence of liver cancer in 2018 were extracted from Global Cancer Observatory (GLOBOCAN). The prevalence of smoking, alcohol consumption, obesity, and diabetes in 2010 for each country were retrieved from the Global Health Observatory (GHO). Primary Outcome: To determine the association between incidence (ASR) and prevalence of risk factors by using multivariable linear regression adjusting for human development index (HDI) and gross domestic product (GDP) per capita.

**Results**

Higher incidence was associated with a higher prevalence of smoking (males: $\beta=0.25$, $p=0.028$) and alcohol consumption (females: $\beta=0.94$, $p=0.042$) (table 1: $\beta$, beta coefficient refers to how much does the incidence (ASR) change per unit increase in risk factor). No association between the incidence and body mass index (BMI) or diabetes were found in the current analysis ($p>0.05$).

**Conclusions**

Smoking and alcohol consumption remain as important risk factors for liver cancer at a country level. Smoking was associated with an increased risk of Country-specific preventive strategies in the reduction of liver cancer burden includes promoting smoking cessation and alcohol control for high-risk populations.