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ORIGINAL ARTICLE

Retrospective Study

African Americans are less likely to receive curative treatment for hepatocellular carcinoma

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Abstract

AIM

To determine if racial disparities continue to exist in the treatment of hepatocellular carcinoma (HCC).

METHODS

A retrospective database analysis using the Nationwide Inpatient Sample was performed including patients with a primary diagnosis of HCC. Univariate and multivariate analyses were utilized to determine racial disparities in liver decompensation, treatment, inpatient mortality, and metastatic disease.

RESULTS

A total of 62604 patients with HCC were included consisting of 32428 Caucasian, 9726 African-American, 8988 Hispanic, and 11462 patients of other races. Caucasian patients were more likely to undergo curative therapies of liver transplant (OR: 2.66, 95%CI: 1.92-3.68), resection (OR: 1.82, 95%CI: 1.48-2.23), and ablation (OR: 1.77, 95%CI: 1.36-2.30) than African-American patients. Hispanic patients were more likely to undergo transplant (OR: 2.18, 95%CI: 1.40-3.39) and ablation (OR: 1.46, 95%CI:

1.05-2.03) than African-American patients. Patients of other races were more likely to receive a liver transplant (OR: 2.41, 95%CI: 1.62-3.61), resection (OR: 1.79 95%CI: 1.39-2.32), and ablation (OR: 2.03, 95%CI: 1.47-2.80) than African-American patients. There are no differences in the rates of transarterial chemoembolization between races.

CONCLUSION

Racial disparities in HCC treatment exist despite emphasis to support equality in healthcare. African-American patients are less likely to undergo curative treatments for HCC.

Key words: Racial disparity; Hepatocellular carcinoma; Liver transplantation; Resection; Ablation

Core tip: Racial disparities in the treatment of hepatocellular carcinoma (HCC) have been noted previously. This study investigated continued disparities in healthcare utilizing the Nationwide Inpatient Sample. African-American patients were less likely to undergo curative treatments, such as liver transplantation, liver resection, ablation, and transarterial chemoablation for HCC despite having less features of liver decompensation.

Sobotka LA, Hinton A, Conteh LF. African Americans are less likely to receive curative treatment for hepatocellular carcinoma. *World J Hepatol* 2018; 10(11): 849-855 Available from: URL: http://www.wjgnet.com/1948-5182/full/v10/i11/849.htm DOI: http://dx.doi.org/10.4254/wjh.v10.i11.849

INTRODUCTION

The incidence of hepatocellular carcinoma (HCC) has increased about 50% since 2003[1,2]. An increasing incidence across all races and ethnic groups has been noted, however the incidence in African-American and Hispanic patients has had the largest increase over the past ten years[1]. The incidence of HCC is two times higher in African-American, American-Indian, Alaskan-Native, and Hispanic patients compared to Caucasian patients[2]. Unlike other malignancies such as prostate cancer, where despite increases in incidence, mortality has actually declined, we have seen a concurrent increase in the mortality of HCC as the incidence increases. The mortality rates are twice as high in African-American patients compared to Caucasian patients[2,3]. A recent study completed using the Surveillance, Epidemiology, and End Results (SEER) database showed the median overall survival of all patients with HCC was 11 mo. However, African-American patients had a significantly worse prognosis compared to Caucasian patients with only a nine-month survival rate[4].

Racial disparities in the treatment of HCC have been highlighted in previous studies. African-American patients who presented with localized disease were less likely to undergo curative therapy with liver transplantation, surgical resection, and ablation compared to Caucasian patients with the same tumor burden[5,6]. Previous studies have also noted that African-American patients were more likely to present with metastatic HCC at the time of diagnosis and were therefore no longer candidates for specific curative treatments[7].

This study aims to investigate continued disparities in the treatment of HCC. We hypothesize that racial disparities will continue to be present despite recent emphasis for equal treatment in healthcare.

MATERIALS AND METHODS

Data source

Utilizing the (Nationwide) Inpatient Sample, which is part of the Healthcare Cost and Utilization Project (HCUP), we performed a retrospective database analysis. The HCUP is one of the largest publically available inpatient databases. Information obtained included primary and secondary diagnoses and procedures, patient demographics, expected payment source, total charges, discharge status, and length of stay[8]. This study is exempt from review from The Ohio State University Institutional Review Board because patient information is de-identified.

Study sample

Utilizing International Classification of Diseases, Ninth Revision, Clinical Modification codes, patient with a primary diagnosis of HCC (ICD-9 155.0) were included in this study. Patients were excluded if they were under the age of 18, or if they had a malignancy in the liver that was not hepatic in origin.

Outcomes of interest

Primary outcomes of interest included treatment disparities in HCC based on race, which was defined as Caucasian, African-American, Hispanic, or other. Specific treatments for HCC that were evaluated included liver transplantation, liver resection, ablation, and transarterial chemoablation (TACE). Secondary outcomes included differences in inpatient mortality, liver decompensation, and metastatic disease.

Covariates

Other variables evaluated included gender, age, insurance provider, region where treatment was received, etiology of cirrhosis, features of liver decompensation, metastatic disease, and comorbidities, defined by the Elixhauser Comorbidity (Table 1)[9] . Modification of the Elixhauser Comorbidity score was performed to exclude liver disease. Features of liver decompensation included ascites, jaundice, and hepatic encephalopathy as previously defined in other studies[10]. These variables

were determined by the appropriate ICD-9 code.

Statistical analysis

Association between race and factors of interest were evaluated using chi square tests. Multivariate regression models were fit for the presence of metastatic HCC, liver decompensation, mortality, and treatment. Terms in each module were determined through backwards selection where hepatitis C, hepatitis B, alcohol, non-alcoholic steatohepatitis (NASH), primary sclerosing cholangitis, primary biliary cirrhosis, autoimmune liver disease, metastasis, Elixhauser comorbidity score, and treatment were eligible for inclusion where appropriate. Data was analyzed using SAS software (version 9.4).

RESULTS

Demographics

There were 62604 patients with a primary diagnosis of HCC included in this study. The majority of the patients were Caucasian (32428, 52%) followed by African American (9726, 16%), Hispanic (8988, 14%), and patients of other races (11462, 18%).

Liver severity, metastatic HCC, and inpatient mortality

Upon univariate analysis, features of liver decompensation were significantly different between races ($P < 0.001$) (Table 1). Multivariate analysis demonstrated that Caucasian and Hispanic patients were more likely to have decompensated liver disease than African-American patients [(OR: 1.16, 95%CI: 1.03-1.30), (OR: 1.28, 95%CI: 1.10-1.30)] (Table 2).

Univariate analysis concluded the presence of metastatic disease was significantly different between races ($P = 0.007$) (Table 1). Upon multivariate analysis, Caucasian patients were less likely to have metastatic disease then African-American patients with HCC (OR: 0.82, 95%CI: 0.71-0.94). There was no statistical difference between other races (Table 2).

Inpatient mortality was significantly different between races upon univariate analysis ($P = 0.017$) (Table 1). Upon multivariate analysis, Caucasian patients were less likely to have inpatient mortality compared to African-American patients (OR: 0.78, 95%CI: 0.65-0.93). There was no statistical difference between other races (Table 2).

Inpatient treatment of HCC

There was a significant difference in treatment between races in the univariate analysis ($P < 0.001$) (Table 1). Upon stepwise multivariate analysis, Caucasian, Hispanic, and patients of other races were more likely to undergo liver transplantation compared to African-American patients [(OR: 2.66, 95%CI: 1.92-3.68), (OR: 2.18, 95%CI: 1.40-3.39), (OR: 2.41, 95%CI: 1.62-3.61)]. Caucasian patients and patients of other races were also more likely to undergo surgical resection than African-American patients (OR: 1.82, 95%CI: 1.48-2.23), (OR: 1.79, 95%CI: 1.39-2.32). Caucasian, Hispanic, and patients of other races were more likely to undergo ablation compared to African-American patients (OR: 1.77, 95%CI: 1.36-2.30), (OR 1.46, 95%CI: 1.05-2.03), (OR: 2.03, 95%CI: 1.47, 2.80)]. There was no significant difference in the rates of TACE between races (Table 3).

DISCUSSION

African-American patients are less likely to undergo curative treatments for HCC, and this study confirms that treatment disparities continue to exist despite efforts to reduce healthcare disparities. TACE was the only treatment without a disparity in utilization between races. TACE, however, is not considered to be curative for HCC. It is a means of controlling the malignancy and is often used to downstage tumor burden for liver transplantation or to keep tumor burden within transplant criteria. Differences in treatment exist despite African-American patients being less likely to present with decompensated disease compared to Caucasian patients. We know that patients whose disease is better compensated have a better tolerance of liver directed therapies for HCC. African-American patients have increased rates of metastatic disease and higher inpatient mortality. There are multiple factors that contribute to racial disparities in the management of HCC, including disease progression at time of diagnosis and social determinants of health. It is crucial to recognize these factors and their associations in order to formulate interventions to reduce racial disparities in treatment given the direct effect on patient survival and quality of life.

African-American patients are less likely to undergo curative treatments for HCC and many factors influence this disparity with the presence of metastatic disease being one major limitation to treatment[11]. African-American patients were more likely to have metastatic disease at the time of initial diagnosis[7]. This may be influenced by decreased HCC screening exams in African-American patients[12] and also by genetic differences between races. The presence of metastatic disease is not the only contributor to treatment discrepancies, however. Previous studies have found that African-American patients were less likely to undergo surgical treatment for HCC than Caucasian patients even when they presented with the same tumor burden and both groups were within Milan criteria[13].

Social factors, specifically the location in which patients receive therapy play a crucial role when considering treatment for patients with HCC. This study showed that the majority of African-American patients receive care in the Southern region of the United States, and patients living in the Southern United States are less likely to undergo curative therapies of liver transplantation and surgical resection[14,15]. Decreased access to providers who are able to provide timely diagnosis and treatment contributes to this disparity because of the increased rates of physician and hospital bed inequality in the South compared to the North. This makes it more challenging for patients in these areas

Table 1 Demographics and clinical parameters in patients with hepatocellular carcinoma grouped by race

	Caucasian (*n* = 32428)		African-American (*n* = 9726)		Hispanic (*n* = 8988)		Other (*n* = 11462)		*P* value
	n	%	*n*	%	*n*	%	*n*	%	
Age (yr)									< 0.001
⩽ 64	17695	54.6	6980	71.8	5357	59.6	6609	57.7	
65-79	10982	33.9	2287	23.5	2888	32.1	3762	32.8	
⩾ 80	3751	11.6	458	4.7	743	8.3	1090	9.5	
Sex									0.880
Male	23845	73.5	7172	73.7	6572	73.1	8319	72.7	
Female	8583	26.5	2554	26.3	2416	26.9	3122	27.3	
Primary payer									< 0.001
Medicare	15765	48.9	3471	35.9	3645	40.6	4520	39.5	
Medicaid	4155	12.9	2707	27.9	2206	24.5	2573	22.5	
Private insurance	9497	29.4	2236	23.1	2020	22.5	3143	27.5	
Other	2844	8.8	1267	13.1	1118	12.4	1202	10.5	
Geographic region									< 0.001
Northeast	7726	23.8	2603	26.8	1829	20.4	2395	20.9	
Midwest	5904	18.2	1785	18.4	536	5.9	3016	26.3	
South	13086	40.4	4454	45.8	3126	34.8	2102	18.3	
West	5712	17.6	883	9.1	3497	38.9	3950	34.5	
Discharge year									0.917
2010	8180	25.2	2194	22.6	2223	24.7	3162	27.6	
2011	8118	25.0	2457	25.3	2386	26.5	2980	26.0	
2012	7910	24.4	2490	25.6	2170	24.1	2660	23.2	
2013	8220	25.4	2585	26.6	2210	24.6	2660	23.2	
Hepatitis C	5056	15.6	2497	25.7	1518	16.9	1737	15.2	< 0.001
Hepatitis B	610	1.9	598	6.2	236	2.6	1975	17.2	< 0.001
Alcohol	5566	17.2	1278	13.2	2023	22.5	1157	10.1	< 0.001
NASH	10802	33.3	3436	35.3	3601	40.1	4140	36.1	< 0.001
Primary sclerosing cholangitis	326	1.0	81	0.8	35	0.4	140	1.2	0.046
Primary biliary cirrhosis	131	0.4	0	0.0	10	0.1	34	0.3	-
Autoimmune	91	0.3	25	0.3	60	0.7	⩽ 10	0.1	0.007
Other	14336	44.2	3818	39.3	2967	33.0	4566	39.9	< 0.001
Liver decompensation features									< .0010
Zero	18388	56.7	5690	58.5	4475	49.8	6827	59.6	
One	8968	27.7	2756	28.3	2846	31.7	3092	27.0	
Two	4074	12.6	1010	10.4	1340	14.9	1242	10.8	
Three or greater	998	3.1	270	2.8	328	3.6	301	2.6	
Metastasis									0.007
None	27328	84.3	7841	80.6	7497	83.4	9567	83.5	
Single site	3945	12.2	1453	14.9	1092	12.2	1516	13.2	
Two or more site	1155	3.6	433	4.5	399	4.4	379	3.3	
Elixhauser comorbidity score									< 0.001
< 3	15593	48.1	4177	43.0	4255	47.3	6642	57.9	
⩾ 3	16835	51.9	5549	57.1	4733	52.7	4821	42.1	
Treatment options									< 0.001
Transplant	1254	3.9	190	1.9	252	2.8	349	3.1	
Resection	4306	13.3	823	8.5	728	8.1	1644	14.3	
Ablation	2031	6.3	425	4.4	517	5.8	833	7.3	
TACE	2419	7.5	754	7.8	836	9.3	939	8.2	
Noninvasive treatment	22418	69.1	7534	77.5	6656	74.1	7697	67.2	
In hospital mortality	2924	9.0	1120	11.5	928	10.3	1151	10.1	0.017

TACE: Transarterial chemoablation; NASH: Non-alcoholic steatohepatitis.

to access a Hepatologist and a hospital that is better equipped to meet their needs[16].

Racial disparities in the utilization of TACE was not noted in this study, though previous studies have determined a discrepancy in Native-American patients and Hispanic patients compared to Caucasian patients[17]. This intervention may be considered more frequently in African-American patients because of increased frequency of the disease burden outside of Milan criteria. TACE is considered to be a first line treatment for large or multifocal HCC[18] and may be the ideal treatment for many African-American patients. However, it should be noted that TACE is not considered curative therapy for HCC. The question of whether it is being offered as the sole treatment option for patients who would otherwise be candidates for curative therapy should be raised.

The cost of intervention also influences treatment options. This study shows that African-American patients are the largest percentage of patients with Medicaid insurance compared to other races. Previous analysis on

Table 2 Multivariate logistic regressions comparing outcomes of hepatocellular carcinoma by race

Outcome	Race	Adjusted odds ratio	95%CI
Metastatic Hepatocellular Carcinoma[1]	African-American	Reference	
	Caucasian	0.82	0.71-0.94
	Hispanic	0.87	0.73-1.05
	Other/unknown	0.84	0.70-1.001
Liver Decompensation[2]	African-American	Reference	
	Caucasian	1.16	1.03-1.30
	Hispanic	1.28	1.10-1.51
	Other/unknown	1.14	0.995-1.31
Inpatient Mortality[3]	African-American	Reference	
	Caucasian	0.78	0.65-0.93
	Hispanic	0.82	0.66-1.03
	Other/unknown	0.86	0.69-1.07

[1]Model is adjusted for age, sex, race, geographic region, hepatitis C, alcohol, non-alcoholic steatohepatitis (NASH), liver decompensation features, and Elixhauser comorbidity score; [2]Model is adjusted for age, sex, race, geographic region, hepatitis C, alcohol, NASH, primary biliary cirrhosis, metastasis, and Elixhauser comorbidity score; [3]Model is adjusted for age, sex, race, geographic region hepatitis C, hepatitis B, alcohol, NASH, liver decompensation features, metastasis, and treatment.

Table 3 Multinomial logistic regression to evaluate disparities in treatment for hepatocellular carcinoma based on payer[1, 2]

Intervention	Race	Odds ratio	Confidence interval
Liver Transplant	African-American	Reference	
	Caucasian	2.66	1.92-3.68
	Hispanic	2.18	1.40-3.39
	Other/unknown	2.41	1.62-3.61
Resection	African-American	Reference	
	Caucasian	1.82	1.48-2.23
	Hispanic	1.24	0.94-1.64
	Other/unknown	1.79	1.39-2.32
Ablation	African-American	Reference	
	Caucasian	1.77	1.36-2.30
	Hispanic	1.46	1.05-2.03
	Other/unknown	2.03	1.47-2.80
TACE	African-American	Reference	
	Caucasian	1.15	0.93-1.41
	Hispanic	1.29	0.97-1.72
	Other/unknown	1.19	0.90-1.58

[1]Noninvasive treatment is treated as the reference category; [2]Model adjusts for age, gender, race, geographic region, hepatitis C, hepatitis B, alcohol, non-alcoholic steatohepatitis, liver decompensation features, and Elixhauser comorbidity score. TACE: Transarterial chemoablation.

cost of intervention for HCC has shown TACE to be one of the least costly interventions[19], and therefore may be the intervention most likely to be reimbursed from government funded insurance.

While it is important to recognize racial disparities in the treatment of patients with HCC, it is crucial to recognize the effect this has on an underrepresented patient's quality of life and life expectancy. Studies regarding quality of life in patients with chronic liver disease show decreased functional status and increased chronic, debilitating symptoms such as pain, edema, weakness, anorexia, and vomiting compared to patients without any liver disease[20]. These symptoms, specifically bodily pain and fatigue, are worse in patients with liver disease and HCC[21]. Patients with HCC are noted to have higher rates of depression compared to many other malignancies[22], therefore African-American patients with HCC that fail to undergo treatment are subject to increased complications and diminished quality of life compared to patients that undergo treatment. Life expectancy is also different between patients that undergo treatment for HCC compared to patients that are not treated[23]. If a patient were to undergo treatment, life expectancy and quality of life are improved[24,25].

Multiple interventions could be utilized to reduce disparities in the treatment of HCC. For example, early recognition of liver disease and risk factors for HCC are key to initiate and continue HCC screening in all patients, but specifically in minority patients that may have reduced access to care. This could potentially lead to earlier diagnosis in patients, and therefore the patient would be a candidate for curative treatment.

Limitations in this study must be noted. This data was obtained through the NIS database through ICD-9 coding. Verification of ICD-9 codes could not be obtained for each patient included in the study given patient privacy restrictions. However, these codes have been verified in previous studies. Other factors, specifically

size and number of lesions that affect the treatment for HCC were not included in this study. We were not able to obtain laboratory values and were unable to determine MELD score. Therefore, disease severity was defined by features of liver decompensation. Despite limitations, this study has several strengths. The primary strength was the number of patients that were enrolled in the study over a wide geographic area. Using the NIS database allowed for the collection of a large number of patients that otherwise would not have been obtained in a single institution study.

Disparities in the treatment of HCC based on patient race continue to exist despite emphasis to decrease disparities in healthcare. Despite having decreased rates of liver decompensation, African-American patient have higher rates of inpatient mortality and are less likely to undergo curative treatments, such as liver transplantation, surgical resection, or ablation. Because these patients are less likely to undergo these interventions, African-American patients with HCC are prone to a decreased quality of life and increased mortality rates. Further research needs to be conducted to find ways to decrease this disparity.

ARTICLE HIGHLIGHTS

Research background

Rates of hepatocellular carcinoma (HCC) continue to increase. Despite new treatment options, mortality rates are also increasing specifically in minority patients.

Research motivation

Given recent emphasis to minimize health care disparities, we aimed to determine if racial disparities in the treatment of HCC were decreasing.

Research methods

We performed a retrospective database analysis utilizing The Nationwide Inpatient Sample including patients with a diagnosis of HCC. Univariate and multivariate analyses were utilized to determine racial disparities in liver decompensation, treatment, inpatient mortality, and metastatic disease.

Research results

This large database analysis included 62604 patients with HCC, including 32428 Caucasian, 9726 African-American, 8988 Hispanic, and 11462 patients of other races. Despite having decreased rates of liver decompensation, African-American patient have higher rates of inpatient mortality and are less likely to undergo curative treatments, such as liver transplantation, surgical resection, or ablation than Caucasian patients.

Research conclusions

Racial disparities in HCC treatment exist despite emphasis to support equality in healthcare. African-American patients are less likely to undergo curative treatments for HCC.

Research perspectives

Further emphasis should be placed on determining why disparities continue to exist and hypothesize ways to reduce them in order to facilitate equality in healthcare.

REFERENCES

1 **Mittal S**, El-Serag HB. Epidemiology of hepatocellular carcinoma: consider the population. *J Clin Gastroenterol* 2013; **47** Suppl: S2-S6 [PMID: 23632345 DOI: 10.1097/MCG.0b013e3182872f29]

2 **American Cancer Society**. Atlanta: American Cancer Society, 2016

3 **Nguyen GC**, Thuluvath PJ. Racial disparity in liver disease: Biological, cultural, or socioeconomic factors. *Hepatology* 2008; **47**: 1058-1066 [PMID: 18302296 DOI: 10.1002/hep.22223]

4 **Xu L**, Kim Y, Spolverato G, Gani F, Pawlik TM. Racial disparities in treatment and survival of patients with hepatocellular carcinoma in the United States. *Hepatobiliary Surg Nutr* 2016; **5**: 43-52 [PMID: 26904556 DOI: 10.3978/j.issn.2304-3881.2015.08.05]

5 **Crissien AM**, Frenette C. Current management of hepatocellular carcinoma. *Gastroenterol Hepatol* (NY) 2014; **10**: 153-161 [PMID: 24829542]

6 **Zak Y**, Rhoads KF, Visser BC. Predictors of surgical intervention for hepatocellular carcinoma: race, socioeconomic status, and hospital type. *Arch Surg* 2011; **146**: 778-784 [PMID: 21422327 DOI: 10.1001/archsurg.2011.37]

7 **Sloane D**, Chen H, Howell C. Racial disparity in primary hepatocellular carcinoma: tumor stage at presentation, surgical treatment and survival. *J Natl Med Assoc* 2006; **98**: 1934-1939 [PMID: 17225837]

8 **Overview of the National (Nationwide) Inpatient Sample (NIS).** [Accessed 2016 March 31]. Available from: URL: https://www.hcup-us.ahrq.gov/nisoverview.jsp

9 **Elixhauser A**, Steiner C, Harris DR, Coffey RM. Comorbidity measures for use with administrative data. *Med Care* 1998; **36**: 8-27 [PMID: 9431328 DOI: 10.1097/00005650-199801000-00004]

10 **Cauble S**, Abbas A, Balart L, Bazzano L, Medvedev S, Shores N. United States women receive more curative treatment for hepatocellular carcinoma than men. *Dig Dis Sci* 2013; **58**: 2817-2825 [PMID: 23812858 DOI: 10.1007/s10620-013-2731-9]

11 **Soriano A**, Varona A, Gianchandani R, Moneva ME, Arranz J, Gonzalez A, Barrera M. Selection of patients with hepatocellular carcinoma for liver transplantation: Past and future. *World J Hepatol* 2016; **8**: 58-68 [PMID: 26783421 DOI: 10.4254/wjh.v8.i1.58]

12 **Harlan LC**, Parsons HM, Wiggins CL, Stevens JL, Patt YZ. Treatment of hepatocellular carcinoma in the community: disparities in standard therapy. *Liver Cancer* 2015; **4**: 70-83 [PMID: 26020030 DOI: 10.1159/000367729]

13 **Artinyan A**, Mailey B, Sanchez-Luege N, Khalili J, Sun CL, Bhatia S, Wagman LD, Nissen N, Colquhoun SD, Kim J. Race, ethnicity, and socioeconomic status influence the survival of patients with hepatocellular carcinoma in the United States. *Cancer* 2010; **116**: 1367-1377 [PMID: 20101732 DOI: 10.1002/cncr.24817]

14 **Artiga S,** Damico A. Health and health coverage in the south: A data update. [accessed 2016 February 10]. Available from: URL: http://kff.org/disparities-policy/issue-brief/health-and-health-coverage-in-the-south-a-data-update/

15 **Rana A**, Kaplan B, Riaz IB, Porubsky M, Habib S, Rilo H, Gruessner AC, Gruessner RW. Geographic inequities in liver allograft supply and demand: does it affect patient outcomes? *Transplantation* 2015; **99**: 515-520 [PMID: 25700168 DOI: 10.1097/TP.0000000000000372]

16 **Horev T**, Pesis-Katz I, Mukamel DB. Trends in geographic disparities in allocation of health care resources in the US. *Health Policy* 2004; **68**: 223-232 [PMID: 15063021 DOI: 10.1016/j.healthpol.2003.09.011]

17 **Alkhalili E**, Greenbaum A, Luo L, Rodriguez R, Munoz OE, O'Neill J, Nir I, Morris KT. Racial disparities in treatment and survival of hepatocellular carcinoma in native Americans and Hispanics. *Am J Surg* 2017; **214**: 100-104 [PMID: 28624027 DOI: 10.1016/j.amjsurg.2016.09.033]

18 **Bruix J**, Sherman M; American Association for the Study of Liver Diseases. Management of hepatocellular carcinoma: an update. *Hepatology* 2011; **53**: 1020-1022 [PMID: 21374666 DOI: 10.1002/hep.24199]

19 **Ray CE Jr**, Battaglia C, Libby AM, Prochazka A, Xu S, Funaki B.

Interventional radiologic treatment of hepatocellular carcinoma-a cost analysis from the payer perspective. *J Vasc Interv Radiol* 2012; **23**: 306-314 [PMID: 22277271 DOI: 10.1016/j.jvir.2011.11.016]
20 **Sun VC**, Sarna L. Symptom management in hepatocellular carcinoma. *Clin J Oncol Nurs* 2008; **12**: 759-766 [PMID: 18842532 DOI: 10.1188/08.CJON.759-766]
21 **Bianchi G**, Loguercio C, Sgarbi D, Abbiati R, Brunetti N, De Simone T, Zoli M, Marchesini G. Reduced quality of life of patients with hepatocellular carcinoma. *Dig Liver Dis* 2003; **35**: 46-54 [PMID: 12725608 DOI: 10.1016/S1590-8658(02)00011-7]
22 **Zabora J**, BrintzenhofeSzoc K, Curbow B, Hooker C, Piantadosi S. The prevalence of psychological distress by cancer site. *Psychooncology* 2001; **10**: 19-28 [PMID: 11180574 DOI: 10.1002/1099-1611(200101/02)10:1<19::AID-PON501>3.0.CO;2-6]
23 **Schneider H**. Special problems in the use of respirators in the anesthesia of newborn infants and small children. *Anaesthesist* 1966; **15**: 118-120 [PMID: 5234419 DOI: 10.1002/hep.27443]
24 **Poon RT**, Fan ST, Yu WC, Lam BK, Chan FY, Wong J. A prospective longitudinal study of quality of life after resection of hepatocellular carcinoma. *Arch Surg* 2001; **136**: 693-699 [PMID: 11387012 DOI: 10.1001/archsurg.136.6.693]
25 **Eltawil KM**, Berry R, Abdolell M, Molinari M. Quality of life and survival analysis of patients undergoing transarterial chemoembolization for primary hepatic malignancies: a prospective cohort study. *HPB* (Oxford) 2012; **14**: 341-350 [PMID: 22487072 DOI: 10.1111/j.1477-2574.2012.00455.x]

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