Transarterial Chemoembolization (TACE) versus Transarterial Radioembolization (TARE) for Patients with Hepatocellualr Carcinoma: A Meta-Analysis

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Background and Aim

- Transarterial chemoembolization (TACE) is the most widely used locoregional therapy and its superiority to placebo has been established in randomized controlled trials.
- Transarterial radioembolization (TARE) is increasingly used as an alternative to TACE, although small, single-center trials comparing the two treatments have reported varying results.
- We aimed to perform a meta-analysis of the current literature comparing TACE and TARE.

Methods

- A systemic literature search using Pubmed, Medline, EMBASE, Scopus, Web of Science, and ClinicalTrials.gov was performed using pre-specified keywords with the aid of an informationist for articles to 3/2019.
- The search yielded 1576 unique articles that were screened for inclusion. Data were extracted by each reviewer using standardized forms.
- Study quality assessment was performed with Newcastle-Ottawa Scale (NOS).
- The primary endpoint was overall survival (OS), and the secondary endpoint was time to progression (TTP).
- Meta-analysis was performed using a random effects model using R 3.5.1 and the metafor package.

Results

Table 1. Descriptive statistics

Parameter	Overall	TACE	TARE	P-value
Mean age (years)	62.2	60.7	66.6	0.060
Male (%)	77.0%	77.0%	76.9%	0.96
Race				
White (%)	70.9%	67.9%	73.7%	0.076
Black (%)	12.4%	11.2%	13.5%	0.39
Hispanic (%)	7.3%	9.2%	5.6%	0.10
Asian (%)	8.9%	9.5%	8.4%	0.65
Other race (%)	6.7%	11.1%	2.6%	<0.001
Etiology of cirrhosis				
Alcohol (%)	26.6%	26.3%	27.3%	0.62
HCV (%)	31.4%	29.7%	34.9%	0.012
HBV (%)	10.7%	11.8%	8.4%	0.019
NASH (%)	5.2%	4.9%	5.5%	0.75
Other etiology (%)	23.4%	23.3%	23.6%	0.89
Child-Pugh score				
Child-Pugh A (%)	63.5%	65.1%	61.6%	0.15
Child-Pugh B (%)	33.1%	30.4%	36.5%	0.010
Child-Pugh C (%)	2.1%	2.1%	2.1%	1.00
Barcelona Clinic Liver Cancer Staging				
BCLC 0 (%)	0.0%	0.0%	0.0%	1.00
BCLC A (%)	26.1%	29.7%	22.7%	0.014
BCLC B (%)	43.8%	44.4%	43.3%	0.76
BCLC C (%)	30.2%	25.7%	34.5%	0.002
BCLC D (%)	2.7%	3.6%	1.9%	0.18

Figures and Tables

Figure 1. Forest plot of log ratio of mean overall survival for TACE vs TARE

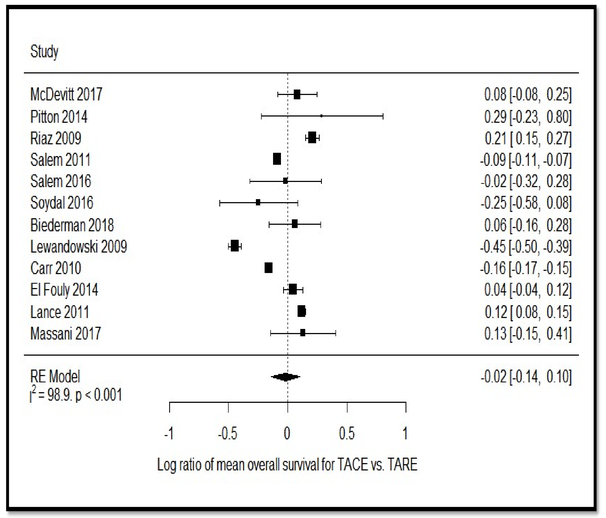
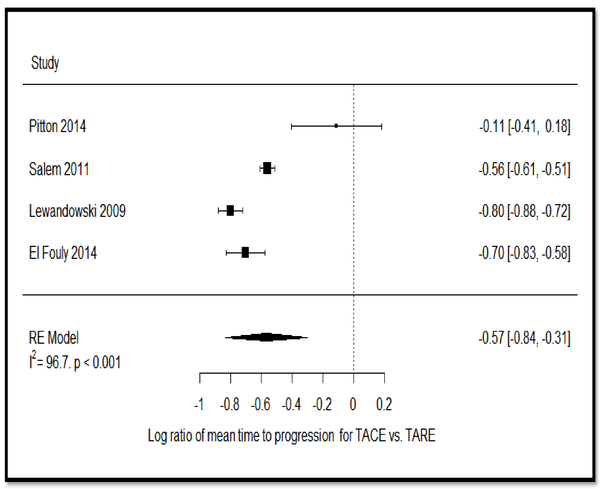


Figure 2. Forest plot of log ratio of mean time to progression for TACE vs TARE



Results

- Eighteen studies met inclusion criteria with 2,561 unique patients, with one randomized trial, 4 prospective cohort studies and the remainder retrospective cohort studies.
- The mean patient age was 62.2 years, and they were majority male (77.0%) and white (70.9%).
- There was no difference in OS between the two modalities in both absolute difference in months (-0.73 months, SD -3.41-1.94) and log-transformed ratio of means (-0.02, SD -0.14, 0.10) (Figure 1), however there was significant heterogeneity among the studies (I^2: 98.9%; p<0.001).
- In the 4 studies with available TTP data, TARE resulted in a longer TTP than TACE (mean TTP 17.5 vs. 9.8 months; difference 7.7, 95% CI 1.7 – 13.9 months) (Figure 2).

Conclusions and Future Directions

- Current data show TARE can provide significantly longer TTP than TACE, although the two treatments do not significantly differ in terms of overall survival.
- Limitations of the data include high proportion of retrospective studies, selection bias, and heterogeneous patient populations
- Given limitations of current data, there is strong rationale for comparing these modalities in a multi-center randomized controlled trial