Selective Internal Radiation Therapy of Metastatic Breast Cancer to the Liver: A Meta-analysis

Chenyu Liu, MS[1], Quinn Smith, MS[2], Bint-e Zainab Awan BA[1], Issa Ali MPH[1]
Shankarapryan Sivanushanthan MS[3], Qian Yu MD[4]

[1] School of Medicine & Health Sciences, The George Washington University, Washington DC, USA
[2] College of Osteopathic Medicine, Kansas City University, Kansas City, MO, USA
[3]School of Medicine, Georgetown University, Washington DC, USA
[4]Department of Radiology, The University of Chicago, Chicago, IL, USA

CIO Symposium on Clinical Interventional Oncology

GW MEDICINE

AT THE FOREFRONT UChicago Medicine

Purpose

- To conduct a meta-analysis to assess the safety and efficacy of yttrium-90 transarterial radioembolization (TARE) in treating breast cancer patients with hepatic metastasis

Methods

- PubMed and Cochrane Database were queried from establishment to November 2020.
- The following keywords were implemented: “breast” AND (“yttrium” OR “radioembolization”). Only clinical studies with a sample size greater than 5 were included.
- The following variables and outcomes were collected: publication year, region, sample size, study design, presence of extrahepatic disease, tumor burden, infused radioactivity, breast cancer subtype, previous treatment, median survival time (MST), length of follow-up, adverse events were collected.
- Radiographical response such as Response Evaluation Criteria in Solid Tumors (RECIST), modified RECIST (mRECIST), and Positron Emission Tomography Response Criteria in Solid Tumors. Meta-analysis was performed with STATA 15.1.

Results

- A total of 18 studies from 14 institutions were included in the present meta-analysis.
- Based on data of 412 patients, post-embolization MST was 9.8 (95%CI: 9.0-11.6) months.
- Patients with additional extrahepatic metastasis had a poorer survival rate compared to those with localized hepatic metastasis-only (MST: 5.3 vs 15 months, $p<0.0001$).
- Patients with <25% liver tumor burden exhibited more promising survival than those with>25% (MST: 10.5 vs 6.8 months, $p<0.0139$).
- Based on RECIST, mRECIST, and PERCIST criteria, tumor response rate was 36% (95%CI: 26-47%), 49% (95%CI: 34-65%), and 47% (95%CI:17-78%), respectively, whereas tumor control rate was 85% (95%CI:76-93%), 73% (95%CI:59-85%), and 97% (95%CI:91-100%), respectively.
- Among 436 patients, post-embolization cholecystitis occurred in 8 (1.8%) patients (≤Grade 2). Thirteen patients developed ulcers (3.0%), and 9 of them were ≥Grade 3 (2.1%). Two had Grade 3 pancreatitis (0.5%). The following biochemical toxicities (≥Grade 3) were observed: elevated bilirubin (16/253, 6.3%), elevated aminotransferase (41/226, 18.1%), elevated alkaline phosphatase (4/91, 4.4%), leukocytosis (3/91, 3.3%), thrombocytopenia (0/16, 0%), and anemia (0/16, 0%).

Conclusion:

- Based on available published evidence, TARE is feasible in treating breast cancer with liver metastasis. Patients with lower hepatic tumor burden and without extrahepatic metastasis demonstrated more survival benefit. Future randomized controlled trials are warranted.