

Holmium-166 Radioembolisation in Patients with Unresectable, Chemorefractory Liver Metastases (HEPAR trial): A phase 1, Dose-Escalation Study

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Highlights

Holmium-166 (166-Ho) radioembolisation is feasible and safe for the treatment of patients with unresectable and chemorefractory liver metastases and enables image-guided treatment.

Background

- The efficacy of radioembolisation for the treatment of liver tumors depends on the selective distribution of radioactive microspheres to the tumor
- The distribution of 166-Ho microspheres can be visualised in vivo by both single-photon-emission CT (SPECT) and Magnetic resonance imaging (MRI)

Objective

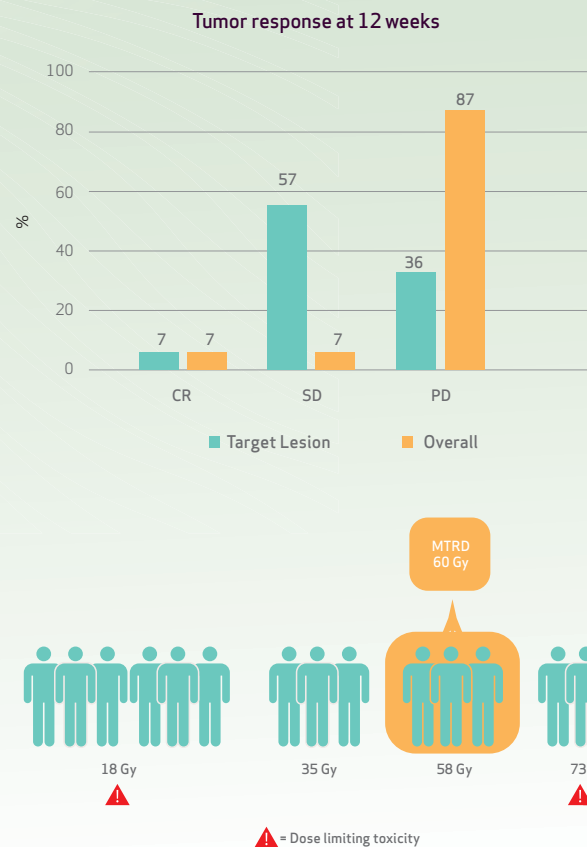
To assess the safety and the maximum tolerated radiation dose (MTRD) of 166-Ho radioembolisation in patients with liver metastases.

Methods

- 15 patients with unresectable, chemorefractory liver metastases were treated with intra-arterial injection of 166-Ho microspheres in cohorts of three patients, with escalating aimed whole-liver absorbed doses of 20, 40, 60, and 80 Gy
- Single radioembolisation with 166-Ho polylactic microspheres, administered by infusion in the liver artery using an arterial catheter in the femoral artery
- The primary tumor types were ocular melanoma (6/15), colorectal carcinoma (6/15), cholangiocarcinoma involvement (2/15) and breast carcinoma (1/15)
- The primary endpoint was the MTRD

Results

- Stable disease or partial response regarding target lesions was achieved in 14/15 patients at 6 weeks and 9/14 patients at 12 weeks after radioembolisation. *See figure*
- According to the study protocol, the study was stopped after two patients in the 80 Gy cohort experienced dose-limiting toxicity (DLT); grade 3/4 haematological DLT in one patient, and grade 3 abdominal pain in another patient. The MTRD was identified as 60 Gy
- Abdominal pain and nausea were the most frequently experienced clinical toxicities



CONCLUSION

¹⁶⁶Holmium radioembolisation is feasible and safe for the treatment of patients with unresectable and chemorefractory liver metastases and permits image-guided treatment. Clinical ¹⁶⁶Holmium-radioembolisation should be done with an aimed whole-liver absorbed dose of 60 Gy.

Key Takeaways

- Holmium-166 radioembolisation is safe and feasible
- Maximum tolerated radiation dose: 60 Gy (whole liver absorbed dose)
- Holmium-166 visualisation in vivo using SPECT and MRI is possible