Selective internal radiation therapies for unresectable early-, intermediate- or advanced-stage hepatocellular carcinoma: systematic review, network meta-analysis and economic evaluation

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Plain English summary

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Hepatocellular carcinoma is the most common type of liver cancer. The choice of treatment depends on the extent of the cancer and liver function. Selective internal radiation therapies deliver radiation directly to liver tumours via tiny beads injected into the main blood vessel into the liver. There are three selective internal radiation therapies: TheraSphere™ [BTG Ltd, London, UK (now Boston Scientific, Marlborough, MA, USA)], SIR-Spheres® (Sirtex Medical Ltd, Woburn, MA, USA) and QuiremSpheres® (Quirem Medical BV, Deventer, the Netherlands).

Our aim was to assess the clinical effectiveness of selective internal radiation therapies for patients with hepatocellular carcinoma that is not treatable by surgery, and to assess whether or not these therapies represent good value for money.

There was no meaningful difference between SIR-Spheres and sorafenib (Nexavar®; Bayer plc, Leverkusen, Germany), which is a cancer drug for advanced hepatocellular carcinoma. Studies of other selective internal radiation therapies and studies in patients with less advanced disease were generally of poor quality, so their results may not be reliable. We could not assess whether or not selective internal radiation therapies are beneficial to patients with early- or intermediate-stage hepatocellular carcinoma, or whether or not TheraSphere and QuiremSpheres are beneficial.

Compared with sorafenib or lenvatinib (Kisplyx®; Eisai Ltd, Tokyo, Japan) (another systemic cancer drug), none of the selective internal radiation therapies were good value for money for treating patients with advanced hepatocellular carcinoma. We found that TheraSphere might be cheaper than SIR-Spheres and QuiremSpheres, but differences between TheraSphere and SIR-Spheres were small.

There was not enough evidence for patients with early or intermediate disease to say whether or not selective internal radiation therapy is good value for treating these patients. Future studies in these populations, alongside any studies comparing the selective internal radiation therapies against each other, would be helpful.

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This report

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