CEeDD lay summary

This clinical trial investigated the safety and feasibility of a new technology called SonoTran, which uses tiny particles and ultrasound waves to help anticancer drugs reach tumours more precisely. The study was divided into three parts, each focusing on a different aspect of the intervention.

The first part looked at the overall safety and feasibility of SonoTran. Nine participants received a single dose of SonoTran particles without any cancer drugs. During the procedure, the feasibility of the technology was measured in real time, allowing doctors to monitor how well the intervention was working as it happened. This real-time feedback was also shared with the patient, so both the medical team and the patient could see the success of the intervention as it progressed. No serious side effects were reported, and the technology worked as expected in all patients. Because of these positive results, the lowest dose tested was chosen for use in the rest of the trial.

The second part of the study examined how well SonoTran improved the delivery and distribution of anticancer drugs to tumours. Seven participants with liver tumours from bowel cancer, who were scheduled for surgery to remove their tumours, were given lower doses of two common anticancer drugs, cetuximab and irinotecan. Some received these drugs with SonoTran, while others received the drugs without it. Researchers measured how much of the drugs reached different areas of the tumours and the surrounding healthy liver tissue. The results showed that patients treated with SonoTran had higher levels of the drugs in certain parts of the tumours, especially around the edges. Importantly, when the removed tissue was examined, there was no sign that SonoTran caused any damage to the cells or blood vessels, confirming that the intervention is safe at the tissue level.

The third part of the study assessed early signs of SonoTran's impact. Ten participants received at least three cycles of standard cancer treatment. Seven of these also received SonoTran during each treatment cycle, while three did not. After treatment, scans showed that tumours shrank in 86 percent of the patients who received SonoTran, compared to 67 percent of those who did not.

Overall, these results suggest that SonoTran is safe, does not harm healthy tissue, and may help anticancer drugs reach tumours more effectively, resulting in a higher rate of tumour shrinkage. Further studies involving larger groups of patients are needed to confirm these encouraging findings.