

## Portal Pressure Impact on Clinical Outcome after Major Hepatectomy: A Systematic Review and Meta-Analysis

Jorge Humberto Gomes Carrapita<sup>1,5\*</sup>, Ana Margarida Abrantes<sup>2</sup>, Bernardo Sousa-Pinto<sup>3,4</sup>,  
Jorge Nunes Santos<sup>5</sup>, Maria Filomena Botelho<sup>2</sup>, José Guilherme Tralhão<sup>2,6</sup>, Jorge Maciel Barbosa<sup>1,7</sup>

<sup>1</sup>General Surgery Department of Vila Nova de Gaia/Espinho Hospital, Portugal

<sup>2</sup>Medicine School, University of Coimbra, Centre of Investigation on Environment, Genetics and Oncobiology (CIMAGO), Coimbra, Portugal. Biophysics Unit

<sup>3</sup>MEDCIDS – Department of Community Medicine, Information and Health Decision Sciences Faculty of Medicine of the University of Porto, Porto, Portugal

<sup>4</sup>CINTESIS – Center for Health Technology and Services Research, Porto, Portugal

<sup>5</sup>Institute of Biomedical Sciences Abel Salazar, University of Oporto, Oporto, Portugal

<sup>6</sup>Medicine School, University of Coimbra, Surgery A, Surgery Department of University Hospital (CHUC), Coimbra, Portugal

<sup>7</sup>Fernando Pessoa University, Oporto, Portugal

### Abstract

**Aim of the study:** To systematically review the evidence regarding the association between portal venous pressure (PVP) after hepatectomy and posthepatectomy liver failure (PLHF) or other postsurgical outcomes.

**Materials and methods:** We searched PubMed, Scopus and Web of Science for studies assessing post-hepatectomy PVP (or its variation) and reporting its association with PLHF or other postsurgical outcomes. We performed a random-effects meta-analysis for the association between development of PLHF and post-hepatectomy PVP and its variation. Heterogeneity was assessed using Q-Cochran test and I<sup>2</sup> statistic. Quality assessment was performed considering ROBINS-1 Cochrane tool.

**Results:** Four studies, assessing 439 patients, met the eligibility criteria and were included in this systematic review. The meta-analyses, including 3 studies, demonstrated that patients developing PLHF did not have a significantly higher post-hepatectomy PVP when compared to the remainder (1.98; 95%CI=-1.44-5.39; p=0.256; I<sup>2</sup>=2%), but had a significantly higher PVP variation (increase) during hepatectomy (1.65; 95%CI=1.15-2.15; p<0.001; I<sup>2</sup>=0%). The quality of the studies allowed to consider the robustness of the conclusions as “median”.

**Conclusions:** An increased PVP variation following hepatectomy associates with a higher risk of PLHF, but the same was not observed for the absolute value of post-hepatectomy PVP.

**Key words:** Hepatobiliary Surgery, Liver, Portal venous pressure, portal inflow modulation, posthepatectomy liver failure, Meta-Analysis.