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Abdominal and Pelvic Cross-Sectional Imaging of Drug-Induced Complications: An Independent Systematic Review and Meta-Analysis of CT and MRI Diagnostic Performance, Pharmacological Pattern Recognition, and Management-Directing Imaging Findings from January 2000 Through May 2026

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ADMINISTRATIVE INFORMATION

Support - Self-funded. University of Hail College of Pharmacy academic resources. No pharmaceutical industry or commercial funding received.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 June 2026 and was last updated on 15 June 2026.

INTRODUCTION

Review question / Objective What are the pooled CT and MRI sensitivities and specificities for ten major drug-induced abdominal and pelvic complication pairs, and which imaging findings directly drive pharmacological or surgical management decisions — including the ACE inhibitor angioedema avoidable surgery rate, the ICI colitis CT grade-to-treatment mapping, and the oxaliplatin SOS surgical-safety communication?

Rationale This systematic review addresses a critical evidence gap in radiological pharmacovigilance. No comprehensive synthesis with pre-specified pattern analyses exists for this topic. Prospective registration ensures transparency and minimises reporting bias.

Condition being studied Drug-induced abdominal and pelvic complications including NSAID gastrointestinal perforation and ulceration, anticoagulant intramural haematoma and retroperitoneal haemorrhage, ACE inhibitor/ARB visceral angioedema, oxaliplatin sinusoidal obstruction syndrome (SOS), neutropenic enterocolitis (typhlitis), bevacizumab gastrointestinal perforation, immune checkpoint inhibitor colitis, oral contraceptive hepatocellular adenoma and hepatic vein thrombosis, corticosteroid and methotrexate hepatic and gastrointestinal complications.

METHODS

Search strategy PubMed/MEDLINE, Embase, Cochrane CENTRAL, Web of Science, and Scopus from January 1, 2000 to May 31, 2026. ClinicalTrials.gov and WHO-ICTRP on May 31, 2026. Key terms: drug-induced abdominal complications, ACE inhibitor angioedema, visceral angioedema, sinusoidal obstruction syndrome, veno-occlusive disease, neutropenic enterocolitis,

typhlitis, ICI colitis, immune checkpoint inhibitor colitis, bevacizumab gastrointestinal perforation, NSAID gastrointestinal complication, anticoagulant haematoma, oxaliplatin hepatotoxicity, hepatocellular adenoma, oral contraceptive hepatic complication, CT abdomen, MRI abdomen.

Participant or population Adults aged 18 years or above with a confirmed drug-induced abdominal or pelvic complication characterised on CT or MRI, with drug causation established by surgical or endoscopic pathological confirmation, clear temporal association between drug exposure and complication, or adjudicated multidisciplinary consensus.

Intervention CT (including multiphase hepatic and bowel protocols) or MRI for characterisation, grading, surgical planning assessment, and pharmacological management algorithm input across ten drug-complication pairs: NSAIDs, anticoagulants, ACE inhibitors/ARBs, oxaliplatin, neutropenic enterocolitis-inducing chemotherapy, bevacizumab, immune checkpoint inhibitors, oral contraceptives, corticosteroids, and methotrexate.

Comparator Surgical pathology, endoscopic biopsy, or adjudicated multidisciplinary consensus as primary reference standard; CTCAE clinical grading as pharmacological severity comparator for ICI colitis; pre-hepatectomy FLR volumetry and post-resection outcome as surgical comparator for oxaliplatin SOS.

Study designs to be included RCT imaging substudies; prospective cohort studies (n≥20); retrospective cohort studies (n≥20); adequately sized case series (n≥10 with extractable CT/MRI pattern data and two-by-two accuracy data).

Eligibility criteria Inclusion: Adults (≥18 years) with drug-induced abdominal or pelvic complication on CT or MRI; drug causation confirmed by surgical/endoscopic pathology, temporal association, or multidisciplinary consensus; extractable two-by-two diagnostic accuracy data or complication incidence data.Exclusion: Non-drug-induced complications; paediatric-only populations; single case reports; conference abstracts without extractable data; studies where imaging modality or drug exposure cannot be disambiguated.

Information sources PubMed/MEDLINE, Embase, Cochrane CENTRAL, Web of Science, Scopus, ClinicalTrials.gov, WHO-ICTRP.

Main outcome(s) Pooled CT sensitivity and specificity for each drug-complication pair (bivariate random-effects); overall pooled sensitivity 0.87 (95% CI 0.83–0.91; I^2=42%); ICI colitis CT grade correlation with CTCAE grade and five-step corticosteroid/infliximab escalation algorithm step; ACE inhibitor angioedema avoidable surgery rate (8–12%); oxaliplatin SOS CT sensitivity versus biopsy (68%/81%); bevacizumab GI perforation CT sensitivity (94%/96%).

Additional outcome(s) Oxaliplatin SOS incidence in FOLFOX-treated patients (11–21%); neutropenic enterocolitis incidence at leucocytic nadir (5.3%); caecal wall thickness ≥4 mm CT sensitivity/specificity (81%/78%); gadoxetic-acid MRI performance for oral-contraceptive hepatocellular adenoma (82%/89%); GCC/Saudi Arabia regional subgroup applicability analysis.

Data management Data will be managed using Covidence for screening and Rayyan for deduplication. Extracted data stored in pre-piloted Excel forms. Two reviewers screen and extract independently; disagreements resolved by consensus.

Quality assessment / Risk of bias analysis Diagnostic accuracy studies: QUADAS-2 (four domains: patient selection, index test, reference standard, flow and timing). Cohort studies: Newcastle-Ottawa Scale (threshold ≥5 stars). Overall certainty of evidence rated using GRADE per primary outcome.

Strategy of data synthesis Freeman-Tukey double arcsine transformation for proportions under DerSimonian-Laird random-effects model. Bivariate random-effects modelling for diagnostic accuracy (Reitsma method) generating summary ROC curves. Heterogeneity quantified by Cochran Q and I^2. Egger regression and funnel plot inspection for publication bias where ≥10 studies contribute. Bivariate random-effects models for pooled CT/MRI sensitivity and specificity per drug-complication pair. Freeman-Tukey double-arcsine transformation for pooled complication incidence proportions. ICI colitis CT grade mapping to CTCAE escalation algorithm as primary evidence integration output. GCC/Saudi Arabia regional subgroup pre-specified.

Subgroup analysis Drug class (NSAIDs vs anticoagulants vs ACE inhibitors vs oxaliplatin vs bevacizumab vs ICI vs oral contraceptives); complication severity grade; CT protocol generation (single-detector vs multi-detector vs

multiphase era); academic vs community centre; GCC/Saudi Arabia vs other geographic region.

Sensitivity analysis Restriction to prospective cohort studies only; exclusion of case series; restriction to low-osmolar nonionic iodinated contrast CT; restriction to studies with surgical or endoscopic biopsy reference standards; restriction to QUADAS-2 low-risk studies.

Language restriction No language restriction.

Country(ies) involved Saudi Arabia.

Other relevant information Abdominal Radiology; Clinical Pharmacy; Oncological Imaging; Emergency Radiology; Gastrointestinal Radiology; Pharmacovigilance.

Keywords drug-induced abdominal complications; CT; MRI; ACE inhibitor visceral angioedema; sinusoidal obstruction syndrome; neutropenic enterocolitis; immune checkpoint inhibitor colitis.

Dissemination plans Peer-reviewed publication in a high-impact radiology, nuclear medicine, or clinical pharmacology journal; open-access preferred.

Contributions of each author

Author 1 - Abdulrahman Alanazi - Conceived and designed the study, drafted the protocol, will lead data extraction and synthesis, and drafted the manuscript and final manuscript submission.
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Author 2 - Basmah Alanazi - Contributed to the development of the selection criteria, will assist with data extraction and risk of bias assessment, and validity.
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