

Background: Microplastics and nanoplastics (MNPs) are pervasive environmental contaminants with potential human health implications. Although laboratory models implicate MNPs in oxidative stress, inflammation, and endocrine disruption, a comprehensive synthesis of direct in vivo human evidence is lacking. We aimed to systematically review studies measuring MNPs in living human subjects and summarise associated health findings. **Methods:** We systematically searched PubMed, Web of Science, Scopus, Cochrane and Embase through 26 December 2024. Two investigators independently screened and selected original research articles that quantified MNPs in biological samples from living humans. We excluded animal, in vitro, cell-line, and injection-based studies, as well as reports on non-plastic micro- and nanoparticles. Data extraction, performed in duplicate, included study design, participant characteristics, detection methods, polymer types, and reported health outcomes. Methodological quality was appraised using Risk Of Bias in Non-Randomized Studies – of Exposures (ROBINS-E). The primary outcome was the presence and burden of MNPs; secondary outcomes were clinical or biomarker associations. No metaanalysis was performed due to heterogeneity. **Results:** From 5 522 records, 25 studies met inclusion. Studies employed pyrolysis–gas chromatography/mass spectrometry (n=9), Raman spectroscopy (n=8), infrared spectroscopy (n=7), and Fourier-transform infrared spectroscopy (n=3), often combined with microscopy for MNP detection. Predominant polymers were polyethylene, polypropylene, polyvinyl chloride, polyethylene terephthalate, and polystyrene. In cardiovascular research (5 studies; n=454), higher thrombus and plasma MNP burdens correlated with inflammatory markers and adverse cardiac events. Reproductive research (seven studies; n=327) linked semen and tissue MNPs to reduced sperm quality and accumulation in tumor and placental samples. Gastrointestinal research (9 studies; n=537) associated fecal MNPs with liver enzyme elevations and gut dysbiosis. Respiratory (3 studies; n=171) and ocular (1 study; n=49) research detected MNPs in airway fluids and vitreous humor respectively, with links to airway inflammation and increased intraocular pressure. ROBINS-E assessments indicated moderate to high risk of confounding and exposure-measurement bias; consistency across detection modalities was limited. **Conclusion:** Human in vivo evidence confirms that MNPs accumulate in multiple organ systems and are associated with inflammation and functional impairment. Methodological heterogeneity and bias constrain causal inference. Prospective cohort studies with rigorous exposure assessment and confounder control are needed to advance understanding and guide policy.

Haemodynamic monitoring and blood pressure management in severe traumatic brain injury: outcomes from a resource-limited neurotrauma ICU

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Introduction: Severe traumatic brain injury (TBI) remains a leading cause of mortality and long-term disability worldwide, particularly in low- and middle-income countries. Prevention of secondary brain injury through optimization of haemodynamic parameters is a cornerstone of neurocritical care. Although international guidelines emphasize maintaining adequate cerebral perfusion pressure and avoiding hypotension, real-world implementation of blood pressure (BP) monitoring and management strategies varies considerably, especially in resource-limited settings. There is limited evidence evaluating how these practices influence outcomes in such environments. This study aimed to assess the effectiveness of haemodynamic monitoring and BP management strategies on short-term outcomes in patients with severe TBI admitted to a tertiary neurotrauma ICU. **Methods:** A cross-sectional analytical study was conducted among 362 adult patients with severe TBI (Glasgow Coma Scale <8) admitted to neurotrauma intensive care units at the National Hospital of Sri Lanka. Data were extracted from clinical records, including demographic characteristics, comorbidities, type of injury, BP monitoring methods, haemodynamic fluctuations, management strategies, and clinical outcomes. Patients were followed up to 30 days after injury. Statistical analysis included descriptive methods, chi-square testing for associations, and multivariate logistic regression to identify independent predictors of survival. **Results:** The study population had a mean age of 48.2±19.2 years and was predominantly male (69.9%). Non-invasive BP monitoring was used in 72.1% of patients, while invasive monitoring was utilized in only 27.9%, reflecting resource constraints. Hypotensive BP fluctuations were more frequent than hypertensive episodes (52.8% vs 42.3%), with a small proportion experiencing both. ICU mortality was 36.2%, with an additional 13.3% mortality observed within 30 days among ICU survivors. Significant associations with poor outcomes included hypotensive BP fluctuations, combined BP instability, and the use of vasopressors, inotropes, and blood transfusions (p<0.05). These findings likely reflect greater illness severity in these patient groups. Positive fluid balance at ICU discharge was strongly associated with increased mortality (p<0.001), while negative fluid balance was associated with improved survival. Patients with combined hypotensive and hypertensive fluctuations demonstrated the worst outcomes, suggesting that haemodynamic variability may be an important prognostic marker. Improvement in GCS during ICU stay was significantly associated with survival (p<0.001). On multivariate analysis, negative fluid balance at ICU discharge remained the only independent predictor of improved 30-day survival (OR 2.76, p=0.008), while other haemodynamic variables lost statistical significance after adjustment for confounders. **Conclusion(s):** Haemodynamic instability, particularly hypotension and fluid overload, is closely associated with adverse outcomes in severe TBI. In this resource-limited setting, fluid balance emerged as the most consistent independent predictor of short-term survival. These findings underscore the importance of individualized fluid management and early stabilization of haemodynamic parameters. Strengthening haemodynamic monitoring capabilities and developing context-specific management protocols may improve outcomes in neurotrauma ICUs in similar settings.