The process of rapid sequence intubation in the prehospital setting: A scoping review

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Background. Ensuring that the patient's airway is secured is one of the essential priorities for emergency care providers in the prehospital setting. Rapid sequence intubation (RSI) intervention allows the administration of induction and paralytic medications that optimise the conditions for insertion of the endotracheal tube. RSI is essential in the management of critically ill patients to address the risks of aspiration of gastric contents and morbidity and premature mortality.

Objective. To systematically explore, map, describe, and provide the extent and nature of published research of the most up-to-date evidence-based elements and guidance of RSI in the prehospital setting.

Method. This scoping review followed a framework proposed by Arksey and O'Malley and refined by the Joanna Briggs Institute. The following databases were utilised to guide the literature searching process across multiple resources: Scopus, Web of Science and PubMed engines. The articles included were full-text publications written in English, published between 2000 and 2023. A search strategy incorporating different combinations of keywords was developed with the assistance of a librarian. A population, context and concepts (PCC) framework was used to guide the inclusion criteria of identified articles. The selected titles and full-text articles were screened on Rayyan software (Rayyan, USA) and presented on the PRISMA flow diagram. Data were extracted and displayed on an Excel spreadsheet (Microsoft Corp, USA). Concepts were identified, categorised, and grouped into themes through thematic analysis.

Results. A total of 2 585 titles and abstracts were screened after duplicates had been removed. Only 138 full-text articles were screened, and 40 articles met eligibility criteria. Categories that were formed from concepts identified were grouped into seven themes, which included: RSI preparations, RSI procedure, training, system requirements, clinical governance, standardisation of RSI, and potential adverse events (AEs) associated with prehospital RSI (PRSI).

Conclusion. The seven themes generated from this review indicate that safe, effective, and successful PRSI is achievable, with success and complication rates comparable to, or better than, those in in-hospital settings. The findings underscore that PRSI is a complex intervention that must be performed by appropriately trained personnel. Furthermore, the review highlights the importance of using a well-practised checklist approach and implementing a robust clinical governance framework to minimise AEs, support continuous quality improvement, enhance patient safety, and ultimately improve clinical outcomes.

Keywords: Prehospital, rapid sequence intubation, adverse events, safety, checklist, emergency care practitioners.

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Contribution of the study

This scoping review contributes to the existing body of knowledge by synthesising the current best evidence on rapid sequence intubation in the prehospital setting. The study highlights key trends, best practices and gaps, providing valuable insights to guide clinical practice, inform training protocol, and support future research aimed at improving patient outcomes during prehospital airway management.

Early access to intubation and ventilation allows for optimal oxygenation in head-injured patients, reduces the risks of secondary brain injury, and may improve clinical outcomes of severely injured and critically ill patients. Rapid sequence intubation (RSI) is regarded as a lifesaving procedure and gold standard for advanced airway management, mainly due to the favourable conditions it creates to facilitate endotracheal intubation (ETI).[1,2] RSI is defined as an advanced airway management procedure in which a sedative agent is administered in rapid succession with a paralysing dose of a neuromuscular blocking agent to facilitate endotracheal tube (ETT) placement.[3] The technique includes protection against aspiration of gastric contents, provides access to the airway for intubation, and permits pharmacological control of adverse responses to illness, injury, and the intubation itself.

The procedure of RSI in the prehospital setting is normally administered for medical and traumatic conditions requiring oxygenation control, positive pressure ventilation, loss of consciousness, an expectation of clinical deterioration, and actual airway compromise.[4] In developing countries, RSI in the prehospital setting is associated with favourable outcomes.[5] RSI was traditionally performed by physician-led teams; however, it is increasingly being conducted by prehospital emergency professionals, including paramedics. This shift has raised concerns regarding patient safety and the potential for adverse events (AEs), underscoring the need for clear institutional protocols, comprehensive training, and evidence-based guidelines to ensure safe and effective practice.[5] A retrospective record review study, which looked at the association of prehospital RSI (PRSI) performed by paramedics in patients with stroke, found that there was a decreased survival rate.[5,6] Worldwide, experts have raised concerns about the safety, efficacy, harm, and delays that PRSI may cause. However, more recent studies have demonstrated higher ETI first-pass and overall success rates among emergency care practitioners (ECPs) compared with earlier research.[7-9] A randomised controlled trial in Australia demonstrated that paramedic RSI in a well-governed system can be performed effectively with improvement in outcomes for patients with traumatic brain injury.[10] An observational study on paramedic-performed RSI in South Africa (SA) supports the use of PRSI, demonstrating clinical improvement in the majority of patients following the intervention.[11]

RSI is known to be a high-risk procedure because it involves more than passing the ETT through the vocal cords.[10] A meta-analysis of intubation success rates of paramedics concluded that prehospital emergency care providers had significantly more intubation failures, highlighting patient safety concerns.[7] Another study, that assessed paramedic RSI in SA, reported a 20% AE rate, which highlights a safety concern but also concluded that an RSI performed by specially trained and well-experienced paramedics is effective.[11]

It must be noted that PRSI is a complex and difficult procedure, requiring multiple critical decisions, skills, and actions. The literature indicates that prehospital professionals should consider performing RSI in seven sequential steps: preparation, pre-oxygenation, pretreatment, premedication, paralysis, placement of the ETT, and postplacement care.[4,12] To the researchers' knowledge, there is a paucity of current synthesised evidence on safety practices for performing RSI in the prehospital setting. The purpose of this scoping review was to explore, map, and synthesise current literature on the elements and safety strategies to be considered when performing PRSI.

Methods

Study protocol

The proposal for this scoping review was registered in the Open Science Framework (OSF) platform (OSF Registries, ref. no. https://doi.org/10.17605/OSF.IO/24F6S). This scoping review followed the five steps described by Arksey and O'Malley[13] and was further refined by the Joanna Briggs Institute (JBI).[14] Furthermore, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist was used to report the flow of information.[15]

Owing to limited research having been conducted on the PRSI, especially in Africa and SA, this scoping review not only focused on prehospital emergency professionals but also included the physician-led prehospital team.

Research question: What are known and considered the most up-to-date evidence-based elements and procedures for RSI in the prehospital setting?

The objectives of this scoping review were as follows:

- To explore and map existing research on PRSI, including publication timelines.
- To identify the geographical distribution of the research to determine where studies on PRSI have been undertaken.
- To summarise the most current evidence-based practices, elements, and clinical guidelines pertaining to the RSI procedure in prehospital emergency care settings.

Inclusion and exclusion criteria

This review included peer-reviewed full-text articles from 2000 to July 2023 written in English. All out-of-hospital observational, experimental studies, recently published reviews, and guidelines that reported on the procedure and elements of PRSI were considered. The population included both adult and paediatric studies reporting on RSI procedures performed in the prehospital setting by ECP and physician-paramedic teams. Manikin and animal studies reporting on other advanced airways such as supraglottic airways, non-drug-assisted intubation and intubation assisted with drugs other than typical RSI drugs, were excluded.

Search strategies

An initial limited search was conducted using PubMed with the guidance of a librarian. The results from the search were used to create keywords which were then developed into a Boolean search. The second search using the Boolean search term was conducted using three databases: Web of Science, Scopus and PubMed. The search was conducted for published articles during the time span between January 2000 and July 2023. Different combinations of keywords included "Rapid Sequence Intubation", "Rapid Sequence Induction", "RSI", "Endotracheal Tube Intubation", "ETI", "EMS Field Intubation", "Airway management", "advanced airway management" OR "Prehospital" OR "outside hospital setting" OR "out-of-hospital" OR "Paramedics" OR "Emergency Medical Services" OR "EMS".

Following the execution of the search strategy, the articles were collated in EndNote Library version 20. The duplicates, non-English articles, and articles from before the inclusion date were removed. The article and abstract were screened for relevance. The subsequent full-text screening was performed independently by two reviewers (TM and NM) against the agreed-upon inclusion and exclusion criteria. A third reviewer (TK) was invited to resolve conflicts regarding the inclusion of eligible studies. The process of screening evidence was recorded on a PRISMA diagram (Fig. 1).

Data charting, extraction, and synthesis

The data were extracted and charted as suggested by the Joanna Briggs Institute[14] and summarised descriptively according to the objectives and questions of the scoping review. A data extraction document, an Office Excel (Microsoft Corp, USA) spreadsheet, was used to record the relevant details of the articles found during the scoping review search. Using the data extraction document, the primary researcher and a second reviewer independently screened the articles to determine their relevance to the study. For articles deemed eligible for inclusion, each reviewer independently extracted and recorded the relevant variables from the articles into the data extraction document.

Results

The database search was conducted in October 2023. Initially, 2 677 articles were found in the search engines, 93 articles were removed as duplicates, leaving 2 584 articles for title and abstract screening. A total of 2 446 articles were excluded after being screened by titles and abstract, and only 138 articles were left. The 138 full-text articles were screened using the study's objectives by two reviewers (JM and NM). Following a full-text review, 99 articles were excluded, 39 articles were included in the study, and 1 article was later included from other sources. Table 1 shows the publication timelines. The variables regarding PRSI from the 40 articles were collated. The list of variables identified after extraction and documentation is presented in Table 2.

Synthesis of results

This scoping review followed the PCC (population, context, concepts) framework:

- Population. All the included adult and paediatric studies demonstrating PRSI.
- Context. Most studies were conducted in the UK (*n*=10; 25%), followed by the USA (*n*=6;15%), Australia (*n*=4; 10%), Denmark (*n*=1; 2.5%), France (*n*=1; 2.5%), Norway (*n*=1, 2.5%) and unspecified countries (*n*=11; 27.5%). None of the studies was conducted in African countries (0%) other than South Africa (*n*=6; 15%).
- Concepts. The following concepts were mentioned for ensuring safe, effective, and successful PRSI: RSI preparations, RSI procedure (7 sequential steps), RSI training, system requirements for RSI, comprehensive clinical governance, standardisation of RSI, and potential AEs associated with RSI.

Table 2. RSI data variables emerged from the scoping review

Variables	Categories/subthemes
RSI preparations	Principles of RSI
	Indications
	Airway assessment
	Predictors of difficult airway
	Predictors of difficulty in laryngoscope
	Predictors of difficult BVM
RSI procedure (7 sequential steps)	Patient preparation, positioning and airway assessment
	Pre-oxygenation
	Physiological optimisation
	Premedication
	Induction and paralysis
	Positioning, protection and placement with proof
	Post-intubation management
Training	Theoretical knowledge
	Simulated practice of RSI
	Clinical practice of RSI
System requirements	Adequate equipment
	Adequate personnel to perform RSI
	Standard operating procedure
	Checklist and algorithm
Comprehensive clinical governance	Quality assurance
Standardisation of RSI	Preparation
	Performance
	Monitoring
	Guidelines
	Procedure
	Equipment
Potential adverse events associated with RSI	Blood pressure (hypertension/hypotension)
	SpO_2
	Heart rate (bradycardia/ tachycardia)
	$ETCO_2$

Discussion

Objective 1. To explore and map existing research on PRSI, including publication timelines

From 2010 to 2023 the number of publications on the PRSI topic increased, indicating increased research interest in the topic over time. While there are variations across individual years, the field gained momentum from around 2013 onwards. Notable peaks were observed in 2015, 2021 and 2022, indicating a period of heightened scholarly activity. The slight decline in 2023 may represent normal fluctuation rather than decline in research interest.

Objective 2. To identify the geographical distribution of the research to determine where studies on PRSI have been undertaken

The majority of studies included in this review originated from high-income countries (HICs). Collectively, these account for nearly two-thirds of the total publications. The predominance of studies from HICs is not surprising as these settings typically have well-established emergency medical service (EMS) systems, better access to resources and stronger research infrastructure. Publications from low- and middle-income countries (LMICs) were markedly underrepresented, with SA being the only African country contributing to the literature.

SA's contribution, despite its being an LMIC, reflects its relatively advanced EMS compared with other LMICs, supported by formalised EMS training, regulatory frameworks under the Health Professions Council of South Africa (HPCSA), and academic institutions with established prehospital research capacity. The absence of publications from other LMICs may be attributed to several factors, including limited EMS systems, lack of resources for advanced prehospital intervention, lack of governance structure for RSI, and restricted research capacity. This aligns with international literature reports that in many LMICs, prehospital emergency care systems are often characterised by fragmentation and limited coordination, with lack of trained medical personnel and first responders, inadequate essential medical equipment, and substandard infrastructure.[16,17] This uneven geographical distribution highlights a significant research gap in LMICs, particularly across Africa, where the burden of trauma and critical illness is high, yet evidence to guide PRSI practice is minimal.[16]

Objective 3. To summarise the most current evidence-based practices, elements, and clinical guidelines pertaining to the RSI procedure in prehospital emergency care settings

There are seven variables that emerged from this review using the scoping methodology to ensure continuous quality improvements, reduce the incidence of AEs, improve safety, efficacy, and success of PRSI, and be of a similar standard to in-hospital RSI practice.

Table 1. Publication timelines

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Publications, *n*	0	2	0	3	1	5	2	1	3	3	3	7	6	4

The publication timelines show an increased growth in the number of publications on the PRSI topic from 2010 through to 2023, indicating increased research interest in the topic.

RSI preparation

One of the most important and often overlooked components of the PRSI procedure is preparation. The literature recommends that preparation for RSI should include the principles, indications, and assessments of the patient's airway before RSI can be undertaken.[5,18] The indications for PRSI procedure have been discussed in multiple studies, and it is recommended that indications should be classified broadly under the following five categories: failure of airway patency, failure to protect the airway, especially if the Glasgow Coma Scale is below 8, failure to provide adequate ventilation and oxygenation, anticipated clinical course, and to facilitate safety.[4,18,19] The literature further recommends that, for a better chance of PRSI success, practitioners should always assess the patient for prediction of difficulty in the airway, prediction of difficulty in laryngoscopy, prediction of bag-valve-mask, and prediction of difficulty in surgical cricothyrotomy, and prepare and plan accordingly.[20,21] This implies that the practitioner must ensure optimal patient preparation prior to performing RSI and must have all standard and backup airway management equipment readily available, including a bag-valve-mask, bougies, supraglottic airway devices, and equipment for performing a surgical airway, if necessary.

RSI procedure (seven sequential steps)

Step 1. Optimisation of patient positioning is one of the most critical first steps in the PRSI procedure. It has been reported that elevation of the patient's head during RSI has been associated with better glottic visualisation, higher first-pass success (FPS) rates, longer safe apnoea times, and fewer complications such as hypoxia and aspiration.[22] It is also recommended that the patient's head be extended and slightly elevated ('sniffing position') to improve intubation FPS.[22] The inclined (semi-Fowler) position is recommended by the literature as an alternative to the sniffing position in the absence of neck injury, as it is associated with higher rates of FPS and grade 1 view on laryngoscopy when compared with the supine position.[23]

Step 2. The second step is preoxygenation to reduce the risk of peri-intubation hypoxia. Oxygen desaturation occurs frequently during PRSI and is associated with increased mortality.[24] The literature emphasises that preoxygenation should be achieved with 15 L/min nasal cannula and non-rebreather mask oxygen in patients with normal respiratory efforts, and nasal cannula 15 L/min and 100% oxygen via bag-valve-mask in patients with reduced respiratory efforts for at least 3 to 5 minutes.[18,24-26] In addition to preoxygenation, the provision of apnoeic oxygenation with a nasal cannula where the airway is patent should be used, to minimise the rate of desaturation.[25,27,28]

Step 3. Physiological optimisation. The literature recommends that every patient undergoing PRSI should be monitored with available non-invasive monitoring devices, including a cardiac monitor electrocardiogram (ECG), non-invasive blood pressure and oxygen saturation, at least every 3 to 5 minutes.[19,29,30]

Step 4. Premedication refers to the administration of systemic analgesia prior to performing RSI, aimed at blunting the sympathetic response to laryngoscopy and intubation, while also providing adequate analgesia, as intubation is a painful and potentially distressing procedure.[31] The literature strongly recommends that haemodynamically stable patients who are not grossly hypovolaemic should receive a dose of 3 µg/kg fentanyl, and a reduction in fentanyl dose of 1 µg/kg for suspected hypovolaemia and frail or elderly patients to assist with the attenuation of laryngoscopic response, and an omission of premedication in critically haemodynamically unstable patients.[18,19,25,31,32]

Step 5. Ketamine is frequently the preferred induction agent for RSI in the prehospital setting owing to its rapid onset and its ability to enhance laryngoscopic view, thereby increasing the likelihood of a successful intubation.[5,33,34] Etomidate is commonly cited as an alternative agent. Recommended dosing includes ketamine at 1 - 2 mg/kg and etomidate at 0.2 - 0.3 mg/kg.[4,5,19,25,29,32] However, several studies have indicated that there is no universally agreed upon

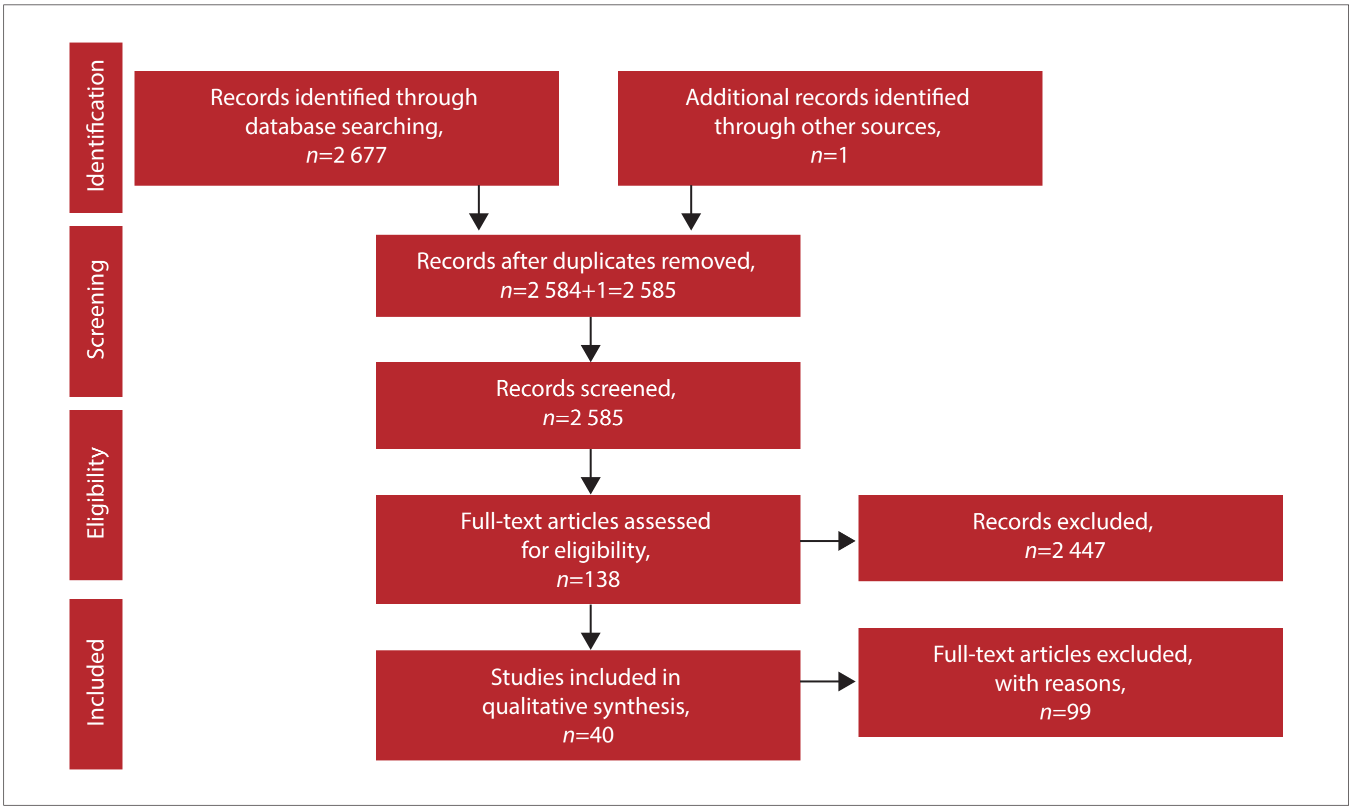

Fig. 1. PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) flow diagram.

anaesthetic agent of choice for PRSI. This uncertainty arises from the varying advantages and disadvantages associated with each agent. The selection of the induction agent is often left to the clinical judgement of the attending practitioner, taking into consideration factors such as the patient's haemodynamic status.[29,35-37]

To provide safe and effective PRSI, an ideal neuromuscular blocking agent (NMBA) should provide the best intubating conditions (muscle relaxation) in the shortest period of time, rapid recovery, and minimal haemodynamic effects.[5] Succinylcholine at a dose of 1 - 2 mg/kg is supported by multiple studies as a first-line agent because of its rapid onset of action and short duration of action.[4,21,25,38] Rocuronium is accepted as an alternative to succinylcholine because of its rapid onset but long duration of action at 1 - 1.5 mg/kg.[4,18,25,39] Determining which paralytic agent to use requires clinical judgement that must be left to the practitioner's discretion. There is no single guideline that will apply to every case. Practitioners must use guidelines, standard operating practices, and checklists, in combination with their clinical knowledge, to make these complex decisions.[40,41]

Step 6. Positioning and placement with proof. All tracheal intubations should have their position confirmed immediately with quantitative continuous waveform capnography.[20] In addition to end-tidal carbon dioxide ($ETCO_2$) as a primary confirmation method, the following are recommended by the literature as secondary methods: symmetrical chest rise visualised with ventilation, symmetrical breath sounds auscultated, absence of gurgling sounds in the stomach with ventilation, and misting of the ETT.[41,42] The ETT should be secured using a commercial device or other reliable means. The provider must accurately identify and document the depth of ETT placement, measured at the level of the teeth or gum line, to ensure proper positioning and facilitate ongoing monitoring.[20]

Step 7. Post-intubation management. Analgesia and sedation are of utmost importance for patient comfort and respiratory compliance with ventilation.[22,43] The consensus in three of the studies is to titrate benzodiazepine (midazolam 0.1 mg/kg) and opioids (fentanyl 1 µg/kg or morphine 0.1mg/kg) to smaller and more frequent doses based on physiological indicators.[25,43,44] The literature recommends mandatory monitoring of $ETCO_2$, blood pressure, heart rate (HR), and oxygen saturation as post-intubation care.[5,25,30]

Training

RSI requires a practitioner to be able to understand and apply advanced airway management knowledge and skills, to make clinically sound decisions and solve challenges.[3,10] The literature recommends that PRSI training and assessment should incorporate theoretical knowledge, focusing on an understanding of RSI procedures, including the principles, preparations, indications, contraindications, clinical decision-making, and potential AEs under emergency conditions.[44] Clinical simulation practice and related skills should also be included and tailored in such a way that they will incorporate scenarios involving the application of the theoretical outcomes stated above.[44,45] Lastly, clinical practice and associated skill development should include the performance of RSI in the prehospital setting under the supervision of practitioners experienced in the procedure. The literature further emphasises the importance of ongoing education and training, advocating for structured and continuing professional development programmes to maintain competency in PRSI.[3,30,44]

System requirements

Multiple studies have recommended that EMS providers who are incorporating PRSI should ensure standard and adequate advanced airway equipment for RSI is available, including bougie, $ETCO_2$, video laryngoscope, rescue airway devices and surgical cricothyrotomy, for difficult intubation.[3,22,25] The literature emphasises the use of bougie on every emergency intubation to improve the glottic view and first-pass intubation.[22] EMS providers must also mandate the use of quantitative $ETCO_2$ for confirmation of correct tracheal tube placement[5,25,30] in addition to other confirmation methods.

The use of checklists, algorithms, and standard operating procedures (SOPs) is strongly recommended at all times in the literature, as they promote planning for any potential challenges encountered, prevent equipment and preparation errors, and may improve emergency intubation outcomes.[3,26,30,45,46] The use of these clinical tools has been demonstrated to maximise first-pass intubation success, as multiple attempts of intubation are associated with an increased risk of hypoxia, hypotension, or dysrhythmia and mortality rate.[20,26,46] The checklist should be well written and rehearsed, including a failed airway 'can't intubate and can't ventilate plan'. The SOP should emphasise the importance of thorough preparation of the patient, equipment, and the team, utilisation of a pre-RSI checklist, and following recognised guidelines.[20,28,30]

The decision to perform the RSI procedure should be based on a practitioner's on-scene risk-benefit assessment guided by a checklist, SOPs, and guidelines.[19,26,41,45] Where PRSI is indicated, it should be performed in a timely fashion and should not significantly delay the transfer of the patient to the hospital.[21,47] Where PRSI interventions cannot be delivered, careful attention should be given to applying basic airway interventions, ensuring their effectiveness and transportation to the nearest appropriate facility.[47]

Lastly, EMS providers should consider pairing an ECP capable of performing RSI with another RSI-capable ECP or a physician. The literature indicates that such pairings are more than three times as likely to result in successful intubation compared with ECPs working alongside EMT-Basic personnel.[3,30,48]

Comprehensive clinical governance

The importance of a robust clinical governance programme, to reduce the incidence of AEs, ensure continuing quality improvements, improve safety, refine practice, and improve the quality of care, is often overlooked. A trustworthy and purposeful PRSI clinical governance system, including various aspects, for example, monitoring, evaluating, managing risks, RSI database, and provision of education, should be mandated.[49] Given the complexity and risks associated with PRSI, the introduction of a robust framework of clinical governance to ensure competency assessment, appropriate training, continuing quality improvement, and guide clinical practice, should be mandated.[3,45]

The literature recommends that PRSI programmes be monitored with rigorous quality management practices that should include a review of the patient care record and all data/recordings of each RSI case.[49] Quality control measures must include real-time oversight and advice by experienced senior practitioners, who should be available at all times for medical advice and clinical record review involving every RSI case.[3,48,49] Clinical governance must be extended to clinical protocol, appropriate equipment, and system requirements. EMS providers must encourage and mandate practitioners delivering RSI to maintain a logbook of individual cases. Additional examples of practice aligned to clinical governance measures include: After each PRSI, the attending practitioner must fill out an audit form, accompanied by a printout of the patient observations (ECG, pulse rate, non-invasive blood pressure, respiratory rate, oxygen saturation and $ETCO_2$) obtained during the procedure.[45] The clinical lead practitioner should review every RSI and provide feedback to the team.

Potential AEs associated with PRSI

RSI is a high-risk procedure that can carry significant AEs, such as hypotension/hypertension, hypoxaemia, and lethal cardiac arrhythmias, including cardiac arrest. In severely injured or ill patients, the occurrence of such AEs can be linked to high mortality rates and worse clinical outcomes. AEs during RSI procedure are defined in the literature as hypotension (systolic blood pressure (SBP) <90 mmHg), hypoxaemia (peripheral oxygen saturation (SpO_2) <90%), bradycardia (HR <60 bpm), additional medication required to reparalyse or resedate the patient between attempts after initial medication doses, cardiac arrest, equipment failure or malfunctioning that is essential for ETI and failed intubation (total inability to pass an ETT).[8,50]

A hypertensive response during RSI is defined in the literature as a >20% increase in SBP/mean arterial pressure (MAP) above baseline,[18,43,51,52] and a hypotensive response as the occurrence of at least two measurements of SBP >20% lower than baseline with an absolute SBP <90 mmHg, or a MAP >20% lower than baseline with an absolute MAP <65 mmHg.[18,37,43,50-53] Hypoxaemia is defined as a fall in SpO_2 below 92% or a fall of more than 10% if SpO_2 before RSI was below 92%.[50,53] Bradycardia is defined as a fall in HR below 60 bpm during the RSI procedure, and a tachycardic response is defined as a >20% increase in HR above baseline.[51]

Every effort should be made by the practitioners to ensure that hypotension prior to PRSI is corrected with an appropriate amount of fluids and medications. Hypoxia is corrected with adequate pre-oxygenation, and reduction of pre-induction, induction, and paralytic medications is considered in critically haemodynamic unstable patients.[18]

Limitations

There are several limitations to this scoping review. The articles that were not written in English were excluded owing to a lack of translation services. There may have been grey literature and relevant studies that were possibly missed during the literature search owing to the disparity of the search terms. A lack of similarity in how studies defined PRSI may have affected the review's methods, results, and generalisability. A bias assessment was not conducted since scoping reviews generally provide a broad summary of existing literature.

Conclusion

PRSI and advanced airway management are complex interventions that can carry significant AEs such as hypoxia, hypotension, and cardiac arrest, which may negatively affect the patient. This review demonstrates that safe, effective, and successful PRSI can be achieved with success and complication rates similar to, if not better than, those in areas of in-hospital practice. The literature recommends that RSI should be delivered by appropriately trained practitioners guided by a well-rehearsed checklist approach, SOPs, guidelines, and protocols, standardised equipment, and a robust framework of clinical governance. This approach will ensure competence assessment and continuing quality improvements, thereby improving the safety and efficacy of PRSI and ultimate benefit to patients.

Data availability. The data used for this study are available from the authors on request.

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