

Effect of Rapid Response Team on Morbidity & Mortality in a Tertiary Care Eye Hospital

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Introduction

The global adoption of rapid response teams has been implemented to lower the risk of unexpected ICU transfers, inpatient hospital mortality, and cardiac arrests. It is common for patients to have signs and symptoms of physiological decline several hours before cardiac arrest, and approximately half of the severe adverse outcomes might be avoided.¹⁻⁴ A Rapid Response Team (RRT), sometimes referred to as a Medical Response Team (MRT) or Medical Emergency Team (MET), is a diverse team that promptly responds to the activation of triggers when patients exhibit signs or symptoms of clinical deterioration.⁵

Although there have been continuous advancements in healthcare worldwide to implement RRT, there is inconclusive data about their efficacy in various healthcare environments and their impact on patient

outcomes.⁶⁻⁸ These variations could be attributed to disparities in the methodologies, quality, team composition, and operational time of RRT. The objective of this study was to assess the influence of RRT on patient outcomes in a specialised eye hospital that provides advanced medical care.

Methods

This study was conducted retrospectively in a tertiary eye care institute. The implementation of RRT took place at our hospital in December 2021. Data was gathered between March 2022 and July 2023. The trigger can be initiated by anybody who detected any sign of clinical deterioration in any person (patient/attendant/hospital staff) within the hospital premises. Triggers as shown in figure 1 were strategically positioned on all the outpatient department (OPD) floors, wards, and the main laboratory. The display screen (figure 1) is installed in operation theatre (OT), pre-anesthesia clinics, and a few places in the wards and it displays the location of the event. The RRT consists of five members, with an anaesthesiologist as the leader stationed in the pre-anesthesia care unit (PAC).

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As we have part time Physician and Paediatrician, we have anaesthesiologist leading the RRT.



Figure 1: Trigger and display screen

The team includes an OT nurse who is skilled in initiating intravenous cannulation and administering medication as directed, an OT technician trained in assisting with general anaesthesia and handling emergencies, a ward nurse responsible for monitoring the patient, and another ward nurse who serves as the event recorder. All the RRT members are ACLS (Advanced cardiovascular life support) certified and all other hospital staff are BCLS (Basic cardiovascular life support) certified. The operative hours of RRT were from 8 AM to 6 PM, Monday through Saturday. The hospital OPD and lab winds up by 6 PM. However, for the ward, we have on-call anaesthetist and a on campus duty doctor who takes care of any rapid response call. After the trigger activation, the RRT reaches the location along with crash cart (Figure 2) as early as possible. Once the patient is stabilized a structured documentation form is filled by the team. In case the patient requires specialised treatment in a multi-speciality hospital, the patient is transferred. There is a special consent form for transferring the patient. If the patient was in a stable hemodynamic

state, they were transported in our ambulance. Our Hospital ambulance is equipped with basic life support facility. The usual distance of referral hospital is less than 5 Km. We have a dedicated room in OPD where after initial stabilization the patient is shifted and we use the portable ECG machine at the site of call.



Figure 2: Crash kart used by RRT

If the patient was unstable, they were sent in an ambulance specifically equipped for specialist care hospitals. The hospital safety committee (HSC), consisting of heads of various departments both clinical and non-clinical, thoroughly assessed all the calls, providing RRT with comments on their achievements or insights gained. The primary outcomes of interest were mortality and unplanned transfer to another hospital for additional treatment. The committee's analysis method was two-fold. First, it involved a systematic review of each RRT

call's documentation, which included the trigger, the response, the intervention, and the outcome. Second, the committee conducted regular meetings to discuss the calls in detail, identifying patterns, unique cases, system corrections if any and areas for immediate action.

The committee assessed the performance of the RRT against established protocols and outcome benchmarks. They looked at response times, the appropriateness of clinical interventions, communication effectiveness, teamwork, and the subsequent patient outcomes. The committee also considered feedback from the RRT members and the ward staff to understand the operational context of each call. To make the RRT more efficient, a sustained multimodal education is provided to all staff.

Results

From March 2022 to July 2023, the RRT responded to 171 calls (Figure 3). A significant portion of these calls, 73.68%, originated from the OPD, highlighting the OPD as a critical area for clinical vigilance. The ward accounted for 9.9% of the calls, and the main laboratory was the source of 5.26% of the activations, with the OT and other areas contributing minimally.



Figure 2: Crash kart used by RRT

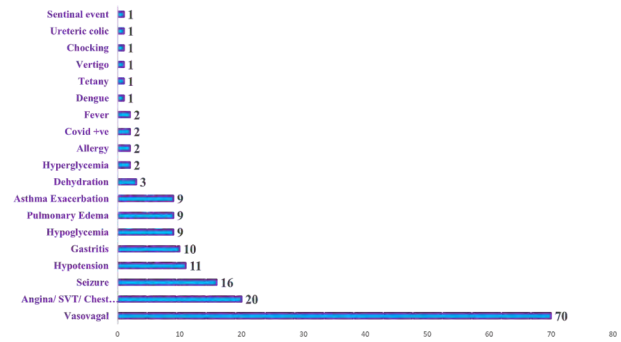


Figure 4: Reasons for RRT activation during the study period

Figure 4 shows the causes of triggers for RRT activation. The most common triggers for RRT activation were vasovagal incidents (70 incidents), and angina/SVT/ chest pain (20 incidents). In the outpatient and laboratory, vasovagal syncope was the most common trigger. In OT, pulmonary edema was the most common trigger. Notably, the data indicated that the RRT interventions led to the stabilization of patients in 85% of the cases. Only a small percentage, approximately 10%, required an unplanned transfer to a multi-specialty hospital for further treatment. The remaining 5% of the cases were managed with additional in-hospital interventions without the need for transfer. One RRT call converted to code blue and the patient died. The committee's analysis of the calls provided constructive feedback, with an emphasis on the successes and areas of improvement for the RRT. The committee's analysis yielded several constructive insights.

Discussion

The findings suggest that the RRT was effective in managing acute medical emergencies within the specialized hospital environment. The high number of activations in the OPD indicates that this area may benefit from additional training and resources to recognize and respond to early signs of clinical deterioration.⁹

The fact that the majority of RRT interventions did not result in hospital deaths or unplanned transfers suggests that the immediate medical attention provided was generally effective. However, the percentage of cases that did require transfer to a multi-specialty hospital points to the potential need for expanding the on-site capabilities of the specialized eye care institute or for developing stronger protocols for patient transfer.

Successes

Rapid Mobilization: The RRT consistently met the target response times, demonstrating swift mobilization in critical situations.

Clinical Interventions: Appropriate and timely clinical interventions were noted in most cases, often leading to patient stabilization and avoiding further deterioration.

Cross-departmental Coordination: There was effective collaboration between the RRT and other departments, which was crucial for complex cases requiring multi-disciplinary input.

Areas for Improvement

Post-Intervention Monitoring: The need for improved monitoring and follow-up after the initial RRT intervention to ensure sustained patient recovery was identified.

Training: Additional training was recommended for recognizing early signs of specific conditions that were less frequently encountered but equally critical.

Less deaths during the RRT operational hours may reflect the effectiveness of the team and their interventions. However, it also raises questions about the availability and efficacy of clinical support during

off-hours, suggesting a potential area for further study and possible expansion of RRT coverage.

The diversity of the RRT, including anaesthesiologists, OT nurses, technicians, and ward nurses, appears to be a strength of the program, enabling a multidisciplinary approach to emergency care. The study's results underscore the importance of teamwork and cross-disciplinary collaboration in rapid response scenarios.

The formalized documentation process of the RRT and the thorough assessment of each call by the rapid response committee reflect a commitment to continuous improvement. Feedback loops such as these are crucial for refining response strategies and improving patient outcomes over time.

Despite all the controversy surrounding the utility of RRT, it definitely improves the quality of hospital care and improves the patient safety. It is translated to an increase in patient, family and staff satisfaction

In conclusion, while the RRT at this tertiary eye care institute has shown a positive impact on patient outcomes, continuous monitoring and evaluation are essential. The inconclusive data on RRT efficacy in different healthcare environments suggest that further research is necessary, particularly in specialized medical settings. The ongoing assessment and adaptation of RRT composition, training, and operational protocols will be vital in ensuring the team's continued success and the safety and well-being of patients.

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