THE LINK BETWEEN DISEASE AND ITS CLINICAL RAMIFICATIONS IN PATIENTS HOSPITALISED AFTER ACTIVATING CODE BLUE

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ABSTRACT
When a patient's condition rapidly worsens, hospitals can use Code Blues to mobilise resources quickly. Frailty is becoming more well recognised as a factor in severely ill patients' prognoses. We predicted that if a person's fragility increased, the result would deteriorate after activating Code Blue. We looked into the link between rising infirmity and the consequences of Code Blueinspectingthe patients who were admitted to India's Heart Hospital after activating a Code Bluesingle-centre. The facts and results of the Code Blue were relied on electronic medical data for the infirmity evaluation. We used a compound of hospital mortality and scores on the "Cerebral Performance Categories (CPC)" scale ≥3 to arrive at our final conclusion. The instant results of the inspection and hospital mortality were secondary events. The final analysis included 148 of the 911 patients who had been screened. 73 people were classified as 'frail,' while the others were classified as 'fit.' 78 percent of frail individuals and 41 percent of fit patients ($p<0.001$) achieved the primary result. Frailty was found to be linked with the primary outcome in a multivariable analysis (OR = 2.87, 95 percent CI 1.28-6.44, p = 0.01). Primary outcome chances increased with the presence of a cardiac cause for "Code Blue (OR = 3.52, 95 percent confidence interval [CI]: 1.51-8.05". Hospital mortality and inconsiderate impairment following a Code Blue are both connected with infirmity. Patient frailty is an important prognostic factor and can be used in treatment decision-making.
Key words: Infirmity, Code Blue, Cardiac Arrest.

Introduction
Adults life expectancy after heart attack are only 5.6%, making it the main cause of mortality. Between 4.1% and 40% of patients who suffer an IHCA and are revived survive. Research shows that the survival rates of people with IHCA are affected by a wide range of factors. This includes information about the patient's age, initial heart rhythm, and length of CPR, along with hospital and logistical details like where and when the patient went into cardiac arrest.(Specialist & Registrar, n.d.),not yet dated 'Rapid Response Teams' (RRTs) have been used almost frequently in an effort to enhance hospital mortality associated with arrests. RRTs prioritise acting fast when a patient's condition worsens.

Because of infirmity, especially in the severely ill, assessing health outcomes is becoming increasingly difficult. Recent research has looked into the connection between elderly people's infirmity and cardiac arrests in the hospital. Since(Smith et al., 2019)found an association between delicacy and poor outcomes for all patients treated with RRTs, they decided to investigate this further. One study found a correlation between infirmity and increased hospital mortality, while the other found no such link. Furthermore, none of the research looked at how well the patients functioned after they were discharged from the hospital. Frailty was investigated in order to establish if it was linked with an enhanced risk of death from any cause while in the hospital, in addition to a lower cerebral function score.

Methods
Ethics approval
Research Governance of India Health assessed and authorised this study as an audit activity. Since this was a reconsideringinspection of regularly gathered patient precaution data and not trialstudy, agreement was not necessary from the study's aspirants.

Design and setting
Study participants included people who had previously been treated at India's Heart Hospital, located in the Indian state of Rajasthan. Adult patients receive acute tertiary care at this university-affiliated

metropolitan teaching hospital in Rajasthan, India. There are 454 beds in the hospital, together with a 15-bed intensive care unit.

Patients and data

For this study, all patients above the age of 18 who activated a code blue during admission were assessed for eligibility (n = 911). **(Figure 1)** At least 24 hours and fewer than 365 days following admission, patients admitted to India's cardiac hospital who needed Code Blue were eligible for inclusion. The study did not include any Code Blues for those who weren't already inpatients. The information was gleaned from eligible patients' medical records, and it was done in retrospecthealth information services coded demographic and comorbidity data to create the "Charlson Comorbidity Index (CCI)". An administrative database was used to track the hospital outcomes for each patient. "Clinical Frailty Scale (CFS) and Cerebral Performance Categories (CPC)" scales were manually searched in scanned digital medical records at the time of admission and discharge, respectively. As long as the CFS score ranged from highly fit to vulnerable, patients were labelled fit. Patients with CFS scores of 5 or above were labelled fragile, and vice versa. This is what we learned right away from all of the Code Blue documentation (Rockwood et al., 2005)

Code Blue Data

What sets off a Code Blue in our population scanned digital medical records were used to gather information about when Code Blue should be used, the type of heart rhythm (in the event of cardiac arrest), and recording of the patient's treatment goals before Code Blue was activated.

Outcome Measures

It was discovered that a compoundresults included hospital death or a CPC severity grade of severe or above (CPC 3-5). Patients' specific CPC categories after discharge were affected by Code Blue-related deaths, hospital mortality, and the consequences of the aftereffects (e.g. ICU admission or ward stay).

Statistical Analysis

Using Chi-Tests, patients with frailty (such as gender and mortality) had univariable connections between frailty and these critical patient factors such as starting rhythm, patient monitoring, Rapid Response Calls, and the results of the code.(Stiell et al., 2004)Age, frailty, cardiac vs. other code kinds, shock-able rhythm, documentation of resuscitation status, and the CCI score all played a role in the likelihood of our primary goals occurring when code blue occurred. Following the completion of the univariable studies, a logistic regression model was built. For the generated insights to be as clinically helpful as possible, model features were confined to those that were accessible during Code Blue. "score (CCI) (4.3 vs 5.6, p = 0.006), were more likely to have treatment limitations placed on admission (34% vs 10%, p = 0.007) and more likely to activate code blue response because of cardiac aetiology (62% vs 41%, p = 0.02)"**(Table 1)**

	CFS 1 - 4 n = 75 (mean (SD)/n(%))	CFS 5 - 9 n = 73 (mean (SD)/n(%))	p value
Age (years)	66 (17)	74 (13)	0.007
Length of Stay (days)	16 (22)	11 (9)	0.05
CCI Score	4.3 (3.1)	5.6 (2.3)	0.006
Time to Code (days)	8.5 (16)	6.4 (7)	0.30
Gender			
Male (n = 87)	40 (53%)	47 (64%)	0.17
Female (n = 61)	35 (46%)	26 (36%)	
Treatment Limitations			
For full resuscitation (n = 57)	34 (45%)	23 (32%)	0.007
No Documentation (n = 59)	34 (45%)	25 (34%)	
Not for CPR and/or other treatment (n = 32)	7 (10%)	25 (34%)	
Type of Code			
Cardiac (n = 76)	31 (41%)	45 (62%)	0.02
Respiratory (n = 37)	25 (33%)	12 (16%)	
Other (n = 35)	19 (25%)	16 (22%)	
Initial Rhythm at code			
VF, TF (n = 17)	12 (16%)	5 (7%)	0.08
Other (n = 131)	63 (84%)	68 (93%)	
Monitored			
Yes (n = 107)	49 (65%)	58 (79%)	0.06
No (n = 41)	26 (35%)	15 (21%)	
RRC Criteria in Previous 24h			
Yes (n = 45)	22 (29%)	23 (32%)	0.78
No (n = 103)	53 (71%)	50 (68%)	

Table 1: Standard Demographics.

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Review of the number of Code Blue calls made by healthy and elderly people

Code Blues were equally likely to arise after hours and on weekends in both cohorts. When it came to time from hospital admission to the activation of Code Blue, both fit and fragile patients spent about the same length of time, had about the same number of observations recorded, and had about the same number of RRC criteria missed in the 24 hours before Code Blue when it came to the initial shockable rhythms, 16 percent of fit patients had them and 7 percent of fragile patients did. The primary goal was met by 59% of all patients (Deceased or CPC 3). More than seventy-eight percent (78 percent) of fragile patients met the primary goal41%, p<0.01)**Table 2**

	CFS 1 – 4 n = 75 (%)	CFS 5 - 9 n = 73 (%)	p value
Primary outcome			
Hospital mortality or CPC ≥3 'Severe Disability',	31 (41%)	57 (78%)	p<0.001
Secondary outcomes			
Immediate Outcome of Code			
Deceased (n = 53)	19 (25%)	34 (47%)	0.01
ICU admission (n = 42)	26 (35%)	16 (22%)	
Transfer not required (n = 28)	20 (27%)	8 (11%)	
End of life treatment on ward (n = 16)	7 (9%)	9 (12%)	
Transfer for ongoing monitoring (n = 9)	3 (4%)	6 (8%)	
In Hospital Mortality			
No (n = 67)	46 (61%)	21 (29%)	<0.001
Yes (n = 81)	29 (39%)	52 (71%)	
CPC At Discharge			
Normal Function (CPC 1)	33 (44%)	10 (14%)	<0.001
Moderate Disability (CPC 2)	11 (15%)	9 (12%)	
Severe Disability (CPC 3)	1 (1%)	5 (7%)	
Comatose (CPC 4)	1 (1%)	0 (0%)	
Deceased/Brain Dead (CPC 5)	29 (39%)	49 (67%)	

Table 2: Contrasting between fit and fragile patients, code blue timing and the relationship between the quick response call and the code blue

Multivariate Analysis

When all included characteristics were taken into account, patients with a cardiac code blue had a remarkably higher chance of reaching the complex endpoint of hospital mortality or "CPC ≥3 (OR 3.46, p = 0.004)". The probabilities of achieving the composite endpoint increased by 3% as standard with each additional year of age, although this connection was not statistically significant (p = 0.11). For the composite endpoint, frailty served as an independent predictor that increased odds by three times "(95% confidence interval [CI]: 1.38–6.74)". The odds of achieving the endpoint were reduced by 79% when the rhythm was first shockable (p = 0.01).

Discussion

We discovered that frailty was associated with a nearly threefold enhancement in the composite outcome of hospital mortality or CPC≥3 after an EMT, even after accounting for characteristics such as age, code type, shockable rhythm, evidence of cardiac arrest, and the "Charlson Comorbidity Index." In spite of equal CCI scores and proportions of documented care goals for both the fit and frail patient groups at the beginning, the frail group's CCI score was much higher. A new study from India shows hospital mortality and severe impairment are both higher in frail persons after Code Blue, according to our knowledge. This suggests that the overall level of frailty is a stronger predictor of Code Blue results than age (OR = 1.02, p = 0.11; p = 0.04). Only 1.8% of critically ill patients in a recent UK study made it out of the hospital alive after suffering a cardiac arrest.

When frailty was evaluated in this study, it was by looking at cardiac arrests only, and the DCFS score was higher (6 versus 5). Although the mortality rate in our study was higher (at 95 percent), both of

these risk factors are likely contributing to worse patient outcomes for similar reasons. In India, researchers have looked into the connection between frailty and cardiac arrest(Smith et al., 2019)A Univariate study indicated an association between frailty and an increased risk of death after a cardiac arrest, but a multivariable analysis found no such connection. This finding may have lost part of its significance due to the study's classification and frailty definition. use the Hospital Frailty Risk Score based on ICD-10 (HFRS). Clinical Frailty Index was used in our research (CFI). It's tough to make any conclusions from these two tools because they haven't been put head to head yet. Only cardiac arrests were examined, but our research examined the mortality of all code blues regardless of study type(So et al., 2018)expanded the scope of their evaluation to include all patients assessed by the Rapid Response Team who were fragile (not surely only for Code Blues). The mortality rate of frail patients who were reviewed by an RRT was similar to our study's finding that 71% ((p < 0.007)) were significantly deceased after 30 days.

Frailty research has been highlighted in a number of studies as a significant component in selecting therapy goals for patients.It's a well-known fact that basically, it's a bad concept. (Fernando et al., 2020)The number of frail patients who had documented treatment restrictions previous to the Code Blue has never been tracked by anyone. In our study, the number of frail patients with known restrictions to resuscitative therapy was significantly higher. Treatment restrictions before admission to the intensive care unit (ICU) for frail patients were observed in much larger investigations of frailty (34.1 percent (p<0.007). Frail patients required CPR at a higher rate as compared to non-frail patients (65 percent vs. 47 percent, p=0.03), the study found. To be sure, this is true because to this patient sample's higher than average number of cardiac-related Code Blues (62 percent versus 41 percent; p=0.01).

Implications

For the use of frailty in initial clinical examinations, such as those performed when Code Blue is activated. Following a Code Blue occurrence, fragility is linked to a higher death rate and a lower cerebral performance category, as we've demonstrated. Using these findings, practitioners can talk to their patients about treatment restrictions when they are admitted to the hospital. Although age and comorbidities still dominate many of these discussions, employing frailty would allow clinicians to better assess the degree of vulnerability of a patient and help both patients and doctors make well-informed decisions. A new study shows that frailty can be used as a predictor of clinical outcomes more widely.

Conclusions:

Following a Code Blue, frailty was linked to an increased risk of hospital mortality as well as a lower cerebral performance category. Frailty is a useful tool in prognostication for these individuals, along with other well-known predictors including cardiac aetiology and shockable rhythms. It is possible to avoid actions that are unlikely to affect the course of a patient's illness by taking their level of frailty into account while discussing treatment goals with them.

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