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Reference Article: Than M, Aldous S, Lord S, et al. A 2-Hour Diagnostic Protocol for Possible Cardiac Chest Pain in the Emergency Department: A Randomized Clinical Trial. *JAMA Intern Med.* 2014;174(1):51-58. doi:10.1001/jamainternmed.2013.11362.

Question: Is a rapid diagnostic pathway more effective than a standard-care diagnostic pathway for the assessment of patients with possible cardiac chest pain in a usual clinical practice setting?

Background: Patients presenting to the hospital with chest pain and concern for ACS make up 5-10% of ED presentations annually and as much as 25% of hospital admissions. This group represents a high burden on our health care system in terms of resources both in the inpatient and ED settings. Previous observational trials like the ADAPT trial have showed that using a combination of point of care testing, ECGs, and TIMI score, can quickly identify low risk chest pain patients that can be safely discharged from the hospital with low risk to short term adverse effects. Knowing that many physicians do not follow protocols strictly, this randomized control trial tests this accelerated diagnostic protocol in a clinical setting to see if it makes a significant difference.

Methods: Single-center randomized clinical trial using 1:1 allocation, experimental arm with initial ECG and trop and 2 hour trop and ECG if all negative and TIMI score 0 then considered low risk and discharged, standard arm repeat trop at 6 hours conventional management. High sensitivity Troponin I assay used. Computer-generated block randomization, recruiting personal blinded, Senior physicians that adjudicated for major adverse outcomes were blinded, patients and clinical staff not blinded. Follow up at 30 days for adverse outcomes: death, cardiac arrest, cardiogenic shock, emergent revascularization procedure, high-degree AV block requiring intervention, AMI. Primary end point was discharge from ED in less than 6 hours without adverse event in 30 days. Two arms compared using X2 and fisher exact test. Patients discharged had follow up and stress test scheduled within 72 hours of visit.

Patient Selection: Recruited patients from 8 am-10 pm, 7 days a week over 2 year period, 18 years and older with symptoms consistent with ACS for whom troponin/observational testing planned. Patients excluded if STEMI, initial alternate cause for symptoms present, symptoms >12 hours before presenting, persisting chest pain.

Results: 544 total patients, 273 to conventional arm, 271 to experimental arm. Significantly more patients were successfully discharged within 6 hours of arrival and no adverse events within 30 days using the experimental pathway 52/270 (19.3%) vs. standard care 30/272 (11%), with a statistically significant difference of 8.3%. One patient had adverse outcome within the 30 days, STEMI at day 7 after a misinterpreted stress test, patient was part of the experimental arm. 35 patients from the experimental pathway were classified as low risk but ended up being admitted, none of the 35 patients had a final diagnosis of ACS.

Discussion: In this randomized trial, almost twice as many patients with chest pain were discharged early using the experimental pathway. This has important implications as early discharge can help decrease ED overcrowding and avoid duplication of staff time. Additional less resources and finances are used when patients spend less time in the hospital. This is the first evidence of the effective use of the experimental pathway in a real-life setting and it suggests that this could be duplicated in other centers.

Limitations: Single center study limited generalizability, limited sample size, use of Troponin I as it is unclear how newer high sensitivity troponin assays will effect implementation of the ADP.

Bottom Line: This strategy of using an accelerated diagnostic protocol has evidence that it is safe and requires no additional resources saving money, time, and resources for health care systems.

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