

Supplementary index

Table 1: Summary of relevant studies cited in our paper

Study authors	Study design	Cardiac condition	Number of patients	Type of fasting	Study objective	Follow up duration	Main findings	Conclusion
Abazid et al 2018	Prospective nonrandomised study	HFrEF	249	Ramadan fasting	% of patients who became haemodynamic instability and their clinical profile	?1 month (Ramadan)	-92% of patients remained haemodynamically stable -Profile of patients who became haemodynamically unstable: --higher initial NYHA class (2.19±0.9 vs. 1.6±0.8) --less adherence to medications (67% vs 94%) --less likely to have ischaemic cardiomyopathy (33% vs 57%)	“In most patients with chronic HFrEF, Ramadan fasting is considered safe. Non-adherence to medication and diet are significantly associated with decompensated heart failure during Ramadan”
Al Suwaidi et al 2005	Retrospective review population-based study	HFrEF	20,856 Qatari	Ramadan fasting	Whether Ramadan fasting has any effect on the number of hospitalisations for HFrEF in a geographically defined population	Records over a 10-year period were reviewed (January 1991 to December 2001)	-The number of hospitalisations for HFrEF was not significantly different in Ramadan (208 cases) when compared to a month before Ramadan (182 cases) and a month after Ramadan (198 cases) p>0.37. -There was no significant difference found in the baseline clinical characteristics or mortality (11.5%, 7.7% and 9.6%, respectively; p>0.43) in patients presenting in various time periods.	In this defined population, no significant difference was found in number of hospitalisations for HFrEF while fasting in Ramadan when compared to non-fasting months
Aslam M and Healy MA 1986	Prospective review	Not specified. 3 out of 81 had cardiac conditions.	81 Asian	Ramadan fasting	Medication compliance during Ramadan fasting	1 month (Ramadan)	-35 patients missed doses -8 patients took their tablets at different times -4 patients took all their medication as one single daily dose while breaking their fast in the evening	Medication noncompliance remains a significant problem with patients fasting in Ramadan
Babineaux SM et al 2015	Multi-country, retrospective, observational study	Type 2 Diabetes Mellitus	3777 patients 508 physicians	Ramadan fasting	To describe the characteristics and management of patients with diabetes who chose to fast in Ramadan in 2010	?3 months	-Oral antihyperglycemic therapy was the predominant pre-Ramadan therapy for most patients (76.6%) -Treatment regime was modified before Ramadan for 39.3% of all patients -Almost all physicians (96.2%) reported provided fasting-specific advice to patients -62.6% of physicians report using guidelines or recommendations for the management of diabetes during Ramadan	Physicians have increasingly adopted multiple approaches to the management of fasting during Ramadan, including the adoption of international and/or national guidelines, such that patients are able to fast for a greater number of days without acute complications.

							-64% of patients reported fasting every day of Ramadan -94.2% of patients fasted for at least 15 days	
Batarfi A et al 2020	Multi-center cross-sectional study	Patients receiving oral anticoagulation (heart valve disease, rhythm disorder, vein thrombosis)	808 patients	Ramadan fasting	To characterise patient-guided modification of oral anticoagulation intake during Ramadan and any associated complications from doing so	3 months	-68.4% of patients were taking warfarin, 31.6% were taking a direct oral anticoagulant -19.1% of patients were prescribed twice daily anticoagulation -During Ramadan, 46.9% of patients reported taking their anticoagulation as prescribed to them. -The remaining 53.1% of patients reported modifying drug intake in different ways (31.1% adjusting the time of intake, 13.2% skipped intakes and 2.2% double dosed). -Twice daily anticoagulation was a strong independent predictor for modification during Ramadan -The rate of hospital admission due to either bleeding or thromboembolic complications was higher in patients that modified treatment regimens (15.4%) as compared to adherent patients (6.6%).	Patient-guided modification of oral anticoagulation regime is common during Ramadan. Patients on twice daily anticoagulation are more likely to modify their treatment regime and are more likely to encounter bleeding or thromboembolic complications as a result. Patient education and, where possible, pre-Ramadan modification of treatment regimes may help avoid complications from patient non-compliance or uninformed adjustments.
Kul S et al 2014	Meta-analysis of self-controlled cohort studies	Healthy population	1,476 patients	Ramadan fasting	What effect does Ramadan fasting have on body weight, serum lipid levels and fasting blood glucose before and after Ramadan		-After Ramadan fasting, low-density lipoprotein and fasting blood glucose levels were decreased in both males and females compared to levels prior to Ramadan. -In females, body weight, total cholesterol and triglyceride levels remain unchanged, while high density lipoprotein levels were increased. -In males, Ramadan fasting resulted in weight loss, a significant decrease in total cholesterol and low-density lipoprotein levels and a small decrease in triglyceride levels.	Ramadan fasting can effectively change body weight and some biochemical parameters in healthy subjects especially in males compared to pre-Ramadan period
Okoshi K et al 2019	Animal study	Wistar rats with induced myocardial infarction	N/A	Intermittent fasting (fed every other day)	To compare the effects of intermittent fasting before and after myocardial infarction on rat cardiac remodelling and survival	3 months	-Final body weight and total mortality was lower in the intermittent fasting rats when compared to fasts fed every day. -At baseline, there was no difference in echocardiographic parameters. -12 weeks after MI was induced, intermittent fasting rats had a smaller posterior left ventricular wall thickness, reduced MI size, myocyte diameter and left ventricular volume.	Intermittent fasting initiated before or after MI reduces myocyte hypertrophy and LV dilatation. Myocardial fibrosis and fetal gene expression are not modulated by feeding regimens. Benefit is more evident when intermittent fasting is initiated before rather than after MI.

Ma X et al 2019	Animal study	Mice with induced proteotoxic cardiomyopathy	N/A	Intermittent fasting	To test whether TFEB (a master regulator of the autophagy-lysosomal pathway) activation in the myocardium can be harnessed to treat advanced proteotoxic cardiomyopathy		In mice with induced advanced proteotoxic cardiomyopathy, intermittent fasting resulted in restored lysosomal abundance and autophagic flux. Left ventricular dilatation and myocardial hypertrophy was also attenuated, with mice demonstrating increased percentage fractional shortening and increased survival.	Intermittent fasting and TFEB activation are clinically relevant therapeutic strategies to rescue advanced proteotoxic cardiomyopathy by normalising desmin localisation via autophagy-dependent and autophagy-independent mechanisms.
Mousavi M et al 2014	Nonrandomised prospective observational study	Stable coronary artery disease with normal left ventricular function	148 patients	Ramadan fasting	To investigate the effects of Ramadan fasting in patients with coronary artery disease	1 month (Ramadan)	-Mean age of the cohort was 61.5 years. 50% were male -66% of patients completed Ramadan fast with an average of 22 days of fasting -Chest pain and shortness of breath occurrence was not significantly different between the fasting and non-fasting groups	Patients with coronary artery disease were able to observe the Ramadan fast safely and their combined endpoint of chest pain and dyspnoea was not significantly different from that of the non-fasting ones. The authors suggest that patients with stable coronary artery disease and normal left ventricular function could fast during Ramadan.
Nematy M et al 2012	Prospective observational study	Patients with at least one cardiovascular risk factor (previous coronary artery disease, metabolic syndrome or cerebrovascular disease in the last 10 years)	82 patients	Ramadan fasting	The association of Ramadan fasting and cardiovascular risk factors	1 month	-A significant improvement in 10 years coronary heart disease risk (based on the Framingham risk score) was found in patients undergoing Ramadan fasting. -Patients undergoing Ramadan fasting had a significantly higher high-density lipoprotein and lower plasma cholesterol, triglyceride level, systolic blood pressure, body mass index and waist circumference ($p < 0.05$).	A significant improvement in 10 years coronary heart disease risk score and other cardiovascular risk factors were noted after Ramadan fasting in patients with at least one cardiovascular risk factor.
Salam A et al 2017	Prospective multi-centre study	Patients hospitalised with acute heart failure	4,157 patients	Ramadan fasting	The association of Ramadan fasting with outcomes in patients with	12 months	-306 (7.4%) patients were hospitalised with acute heart failure in the month of Ramadan in 2012. -3,851 (92.6%) patients were hospitalised with acute heart failure outside of Ramadan in the period of February to November 2012.	This study represents (at the time of publication) the largest evaluation of the effects of fasting on acute heart failure. It reported an improved volume status in fasting patients. There were also

					acute heart failure		-Patients admitted with acute heart failure during Ramadan had significantly lower prevalence of symptoms and signs of volume overload compared to patients hospitalised in other months. -Atrial arrhythmias were significantly less frequent and cholesterol levels were significantly lower in Ramadan. -Hospitalisation in Ramadan was not independently associated with increased immediate or 1-year mortality.	favourable effects on atrial arrhythmias and total cholesterol and no effects on immediate or long-term outcomes.
Temizhan A et al 1999	Retrospective review	Acute coronary syndrome	1,655 patients	Ramadan fasting (indirect)	The incidence of acute coronary syndrome in Ramadan in comparison to the remainder of the year in a geographically defined population	6 years	The incidence of acute coronary syndrome was significantly lower in Ramadan from 1991 to 1997 in a single centre in Turkey.	The authors speculate that Ramadan fasting does not increase acute coronary syndrome.
Turin T et al 2016	Systematic review and meta-analysis	Coronary heart disease Stroke Congestive heart failure	1,019 patients	Ramadan fasting	To present a summary of key findings of all the published data on Ramadan fasting in patients with cardiovascular disease	Fifteen studies were selected	The incidence of cardiovascular events during Ramadan was similar to those found in the remaining, non-fasting, months of the year.	Ramadan fasting is not associated with any change in incidence of acute cardiovascular disease.

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