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UNDERSTANDING CARDIAC AND SUDDEN DEATH IN YOUNG INDIVIDUALS: NOVEL INSIGHTS FROM THE OFFICE FOR NATIONAL STATISTICS (ONS) IN THE UNITED KINGDOM

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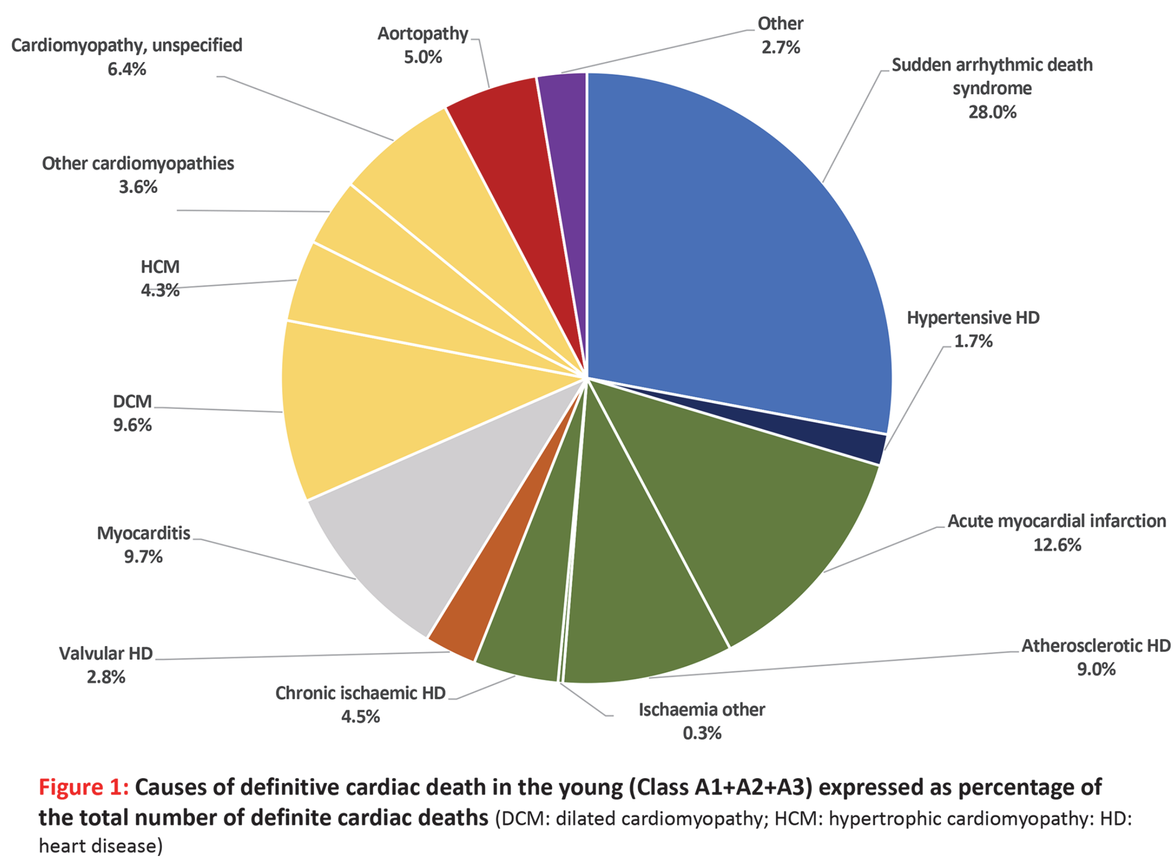
Background Previous data from the Office for National Statistics (ONS) (2002-2005) reported an incidence of sudden cardiac death (SCD) in the young of 1.8 per 100,000 per year.

Aim We aimed to report on the incidence of cardiac and sudden cardiac death in individuals under the age of 35 years in England and Wales between 2013 and 2021, with the goal of identifying any shifts in incidence and causes of SCD, which has not been previously reported.

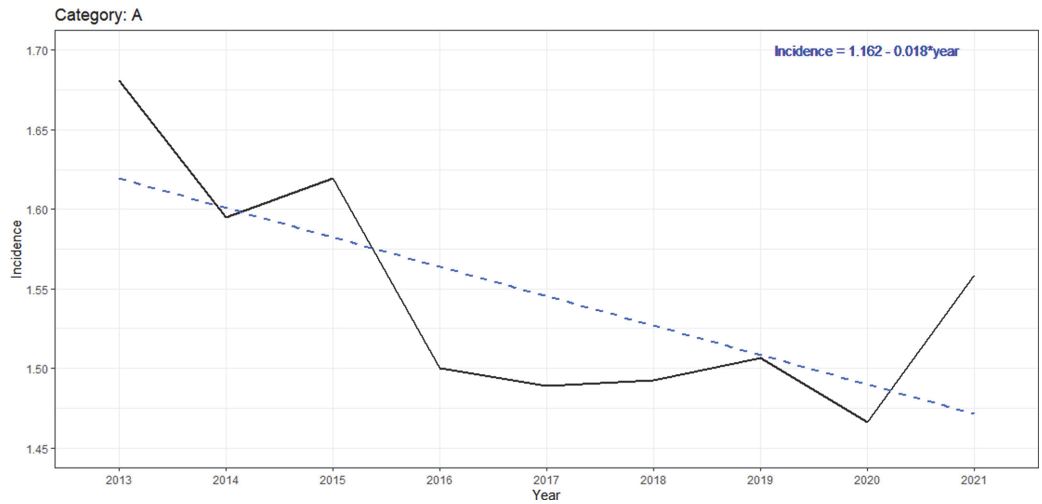
Methods Annual ONS mortality data relating to cardiovascular (CV) and possible CV deaths in individuals aged <35 years was analysed according to international classification of diseases-10 (ICD-10) codes. We classified these deaths into four classes; A1: definite cardiac deaths with no structural heart disease identified at post-mortem (consistent with sudden arrhythmic death syndrome, SADS), A2: definite cardiac deaths with structural heart disease identified at post-mortem, A3: definite cardiac deaths with indeterminate cause, and B: possible cardiac deaths. We calculated incidence rates based on ONS census data of the annual resident population for individuals under 35 years of age in England and Wales.

Results Between 2013-2021, there was a mean of 393 (SD 15.4) definite cardiac deaths per annum (classes A1+A2+A3) (table 1). Based on annual census population estimates (mean 25,467,647±220,118.6), this equates to a mean mortality rate of 1.55 per 100,000 individuals per annum or 7.6 deaths/week. The most prevalent conditions were SADS (28%), ischaemic heart disease (26%), cardiomyopathies (24%), myocarditis (10%), aortopathy including aortic dissection (5%), valvular heart disease (3%) and hypertensive heart disease (2%) (figure 1). There was a mean of 518 (SD 40.9) deaths per annum which may have signified a proportion of possible cardiac deaths (class B) and comprised primarily of deaths from epilepsy (32%), sudden infant death syndrome (20%) and drowning (13%). A male preponderance was observed for both definite and possible cardiac deaths; male to female ratios of 2.1:1 and 1.9:1, respectively. Whilst the overall incidence trend of cardiac and SCD showed a progressive decline over 9 years, there was a notable increase from 2020 to 2021 (figure 2). This may reflect the COVID-19 pandemic's impact on preventative strategies.

Conclusions Our study provides novel insights into a decreasing trend in cardiac and SCD among young individuals in the



Abstract 2 Figure 1 Causes of definitive cardiac death in the young (Class A1+A2+A3) expressed as percentage of the total number of definite cardiac deaths (DCM: dilated cardiomyopathy; HCM: hypertrophic cardiomyopathy; HD: heart disease



Abstract 2 Figure 2 Trends in incidence of definite cardiac and sudden deaths in the young (A1+A2+A3) Incidence quoted as mortality per 100,000 individuals per annum

Abstract 2 Table 1 Number of deaths according to class per year
A1: definite cardiac deaths with no structural heart disease identified at post-mortem (termed, sudden arrhythmic death syndrome, SADS), A2: definite cardiac deaths with structural heart disease identified at post-mortem, A3: definite cardiac deaths with indeterminate cause, and B: possible cardiac deaths

Class	Number of deaths per year									Total number of deaths, n	Mean deaths per annum (SD)	Mean mortality rate per 100 000 per annum (SD)
	2013	2014	2015	2016	2017	2018	2019	2020	2021			
A1	112	110	114	106	101	103	128	113	103	990	110.00 (8.28)	0.43 (0.03)
A2	303	278	286	268	271	270	249	254	280	2459	273.22 (16.27)	1.07 (0.07)
A3	7	14	11	9	9	10	10	10	12	92	10.22 (2.00)	0.04 (0.01)
A1+A2+A3	422	402	411	383	381	383	387	377	395	3541	393.44 (15.35)	1.55 (0.07)
B	555	586	531	551	469	523	501	475	478	4669	518.78 (40.94)	2.04 (0.17)
Total	1399	1390	1353	1317	1231	1289	1275	1229	1268	11751	1305.67 (63.52)	5.13 (0.29)

UK. This may be due to preventative measures such as screening and increased awareness and uptake of cardiopulmonary resuscitation, including availability of automatic external defibrillators. Consistent with contemporary studies, SADS is now the most common cause of cardiac death in the young, highlighting the role for expert autopsy. The burden of cardiac and SCD in young individuals underscores the need to expand access to preventative strategies and targeted risk management.
Conflict of Interest None

3 DIFFERENTIAL EFFECTS OF BARIATRIC SURGERY TYPE ON CARDIAC REVERSE REMODELLING

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Introduction Bariatric surgery is an effective weight loss strategy, with three operations commonly performed: Roux-en-Y Gastric Bypass (RYGB), Laparoscopic Sleeve Gastrectomy (LSG) and Laparoscopic Adjustable Gastric Band (LAGB). Whilst all three of these procedures result in weight loss, it is currently unclear as to whether these operations are equal in their ability to reverse cardiovascular remodelling in obesity. To address this question, we set out to investigate differences in cardiac structure following each type of surgery.
Methods 58 patients underwent cardiac magnetic resonance (CMR) before and after bariatric surgery (26 RYGB, 22 LSG and 10 LAGB), including 46 with short-term (median 251, 219 and 273 days) and 43 with long-term (median 1026, 983 and 1027 days) follow-up. CMR was used to assess LV mass (LVM) and LV mass:volume ratio (LVMVR – a marker of concentric remodelling). Visceral adipose tissue (VAT) was assessed at L5 using a T1 weighted, water suppressed sequence. Epicardial adipose tissue (EAT) volumes were calculated by manual contouring in end-ventricular systole on short axis slices from the mitral valve to the apex.
Results Excess body weight (EBW) decreased from 60.8kg to 36.4kg to 27.5kg following RYGB at baseline, short-term, and long-term, respectively. Similarly, EBW decreased from 51.6kg