

Effects of a drug overdose in a television drama on presentations to hospital for self poisoning: time series and questionnaire study

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Abstract

Objectives To determine whether a serious paracetamol overdose in the medical television drama *Casualty* altered the incidence and nature of general hospital presentations for deliberate self poisoning.

Design Interrupted time series analysis of presentations for self poisoning at accident and emergency departments during three week periods before and after the broadcast. Questionnaire responses collected from self poisoning patients during the same periods.

Setting 49 accident and emergency departments and psychiatric services in United Kingdom collected incidence data; 25 services collected questionnaire data.

Subjects 4403 self poisoning patients; questionnaires completed for 1047.

Main outcome measures Change in presentation rates for self poisoning in the three weeks after the broadcast compared with the three weeks before, use of paracetamol and other drugs for self poisoning, and the nature of overdoses in viewers of the broadcast compared with non-viewers.

Results Presentations for self poisoning increased by 17% (95% confidence interval 7% to 28%) in the week after the broadcast and by 9% (0 to 19%) in the second week. Increases in paracetamol overdoses were more marked than increases in non-paracetamol overdoses. Thirty two patients who presented in the week after the broadcast and were interviewed had seen the episode—20% said that it had influenced their decision to take an overdose, and 17% said it had influenced their choice of drug. The use of paracetamol for overdose doubled among viewers of *Casualty* after the episode (rise of 106%; 28% to 232%).

Conclusions Broadcast of popular television dramas depicting self poisoning may have a short term influence in terms of increases in hospital presentation for overdose and changes in the choice of drug taken. This raises serious questions about the advisability of the media portraying suicidal behaviour.

Introduction

The possibility that media representation of suicide and deliberate self harm may encourage suicidal behaviour in vulnerable individuals has attracted considerable attention,^{1,2} not least because it is a potentially modifiable factor. Studies of televised news reports of suicides have suggested associations with a short term increased incidence of suicide,^{3,4} especially if the reports are repeated and the deaths are highly publicised.⁵ Others have not shown such an effect.^{6,7} Investigations of the effects of fictional portrayal of

suicidal behaviour on television have also produced varying results,⁸ with some studies indicating a strong influence on suicides⁹⁻¹² or on referrals for deliberate self harm.¹⁰ Recent studies in the United Kingdom found either no evidence¹³ or equivocal effects.¹⁴ Most studies in this area have been retrospective so that it has not been possible to investigate whether subjects have seen the media stimulus.¹

Advance notice that an episode of the television drama series *Casualty* would include a serious overdose of paracetamol provided the opportunity to conduct a large scale prospective study of any possible effects on subsequent suicidal behaviour. The box describes the content of the episode, which was shown on 2 November 1996.

We aimed to investigate a possible association between the broadcast of the programme and changes in presentation to general hospitals for deliberate self poisoning (including changes in the substances taken). In addition, a questionnaire survey of patients presenting with self poisoning was undertaken to investigate direct links between viewing the episode and decision to take an overdose, choice of drug, and speed of presentation to hospital.

Depiction of paracetamol overdose in episode of *Casualty*

The overdose storyline involved an RAF pilot in his 30s who was having difficulty returning to work after the aircraft he was flying accidentally crashed, killing a colleague. His sense of guilt and fear that he might have epilepsy led to excessive drinking and marital conflict. He was taken to the accident and emergency department after collapsing, and, after a dramatic scene in which he vomited blood, it was discovered that his blood levels of paracetamol were high. Two nurses were shown urgently questioning him about a possible overdose, and when he admitted to taking about 50 paracetamol over two days earlier they looked very concerned.

The dialogue emphasised the danger:

Nurse: "You should have come in earlier. Paracetamol just keeps on working, steadily destroying the liver."
Patient's wife: "What are you saying? It's too late?"

The message was repeated in the final scene of the story:

Doctor: "Your husband is suffering from severe liver damage caused by the paracetamol. It's disturbing his blood's ability to clot. We've got to transfer him to a specialist unit now . . . It doesn't look very good."

The episode contained several other storylines, including a female vagrant suffering a severe spinal cord lesion, a young boy being badly burned, a demanding middle aged businessman attending with a minor head injury, and a member of staff being diagnosed with multiple sclerosis.

Subjects and methods

Study centres were recruited from the 160 large accident and emergency departments (>35 000 new attendances a year¹⁵) in the United Kingdom and from general hospital psychiatric services. Participating centres were asked to provide weekly data on all presentations for overdose during the three weeks before the programme's broadcast (13 October to 2 November) and the three weeks after (3-23 November), giving three measurements before and after the intervention.¹⁶ Data were collected either through regular monitoring systems or specific counts for the study. Some psychiatric services could supply data only on patients referred for psychiatric assessment. Information was supplied on sex, age band, and use of paracetamol (if recorded).

Clinicians in general hospital psychiatric services were also asked to complete questionnaires after assessment of individual patients during the same period. The questionnaire recorded patients' sex, age, choice of drug (and, for those who took paracetamol compounds, whether they knew these contained paracetamol), time from overdose to presentation at the accident and emergency department, history of taking overdoses, and whether the choice of substance was influenced by anything they had seen on television. Patients were classified as viewers of *Casualty* if they presented in the baseline period and reported seeing the previous week's episode or if they presented after the broadcast and had seen the episode of 2 November. The latter patients were also asked whether viewing the episode had influenced their decision to take an overdose, their choice of drug, and how quickly they sought help. Fifty two hospitals participated across the United Kingdom (see acknowledgments).

We obtained data on suicides, deaths due to undetermined cause, and accidental deaths involving self poisoning with paracetamol and paracetamol compounds that occurred in England and Wales during 1996 from the Office for National Statistics. Viewing figures for *Casualty* were supplied by the BBC and converted to rates using population figures for the United Kingdom.¹⁷

Statistical analyses

We estimated baseline incidence rates of self harm from the counts for the three weeks before the broad-

cast. The effect of the episode was estimated by comparing incidence rates for the three weeks after the episode with the baseline rates. Comparisons were initially made within centres and then pooled using Poisson regression models that incorporated repeated measures and allowed for variation between centres in both baseline levels and changes after the broadcast.¹⁸ The effects of age, sex, and choice of substance were investigated by adding interaction terms to the models. Comparisons were made between accident and emergency departments and psychiatric services, and according to whether centres had participated in the questionnaire section of the study. Changes in presentation rates after the broadcast are reported as percentage changes with 95% confidence intervals.

Questionnaire responses were pooled across centres for the three week periods before and after the broadcast. Relations between viewing the episode and overdose were estimated by comparing characteristics of viewers presenting before and after the broadcast. Significance was tested with Fisher's exact test or the χ^2 test for trend as appropriate. We used STATA¹⁹ and EpiInfo²⁰ software for analysis.

Results

Presentation rates before and after *Casualty* episode

Forty nine hospitals supplied data on presentations for overdose (table 1). In the baseline period 2127 patients presented, while 2276 presented in the three weeks after the broadcast. There was a marked increase in the number of self poisoning patients in the week after the broadcast of the *Casualty* episode compared with the baseline period for both paracetamol and non-paracetamol overdoses (figure).

Self poisoning rates were 17% higher in first week after the broadcast, 9% higher in the second week, and returned to the baseline level in the third week (table 2). The increase for females was significant in both weeks (20% and 17%), whereas that in males was significant only in the first week (14%). Overdoses of paracetamol and paracetamol compounds increased by 19% (both sexes) in the first week after the broadcast and by 23% in the second week (table 2). The increase in non-paracetamol overdoses was smaller, only noted in the first week, and only in females.

Table 1 Details of hospitals that supplied data on presentations for self poisoning at accident and emergency departments and psychiatric services

Region	No of hospitals recruited	Mean (range) No of annual new attendances at A&E	No of hospitals providing weekly counts of overdose attendances (No of attendances)	Source of weekly counts (No of A&E:No of psychiatric services)	No of hospitals completing questionnaires for individual overdose cases (No of questionnaires)
Anglia and Oxford	5	54 270 (46 370-58 980)	5 (741)	4:1	2 (127)
North Thames	4	57 260 (37 670-76 360)	3 (155)	2:1	1 (18)
Northern and Yorkshire	7	56 580 (36 000-87 090)	6 (362)	4:2	3 (85)
North West	5	48 820 (35 000-75 000)	5 (408)	5:0	0 (0)
South Thames	7	55 400 (37 000-75 000)	7 (450)	5:2	3 (89)
South West	10	46 990 (32 460-75 110)	10 (1054)	10:0	5 (193)
Trent	5	82 860 (57 940-119 800)	4 (430)	3:1	4 (266)
West Midlands	4	76 800 (59 240-95 000)	4 (311)	1:3	3 (145)
Northern Ireland	1	14 150	1 (8)	0:1	1 (8)
Scotland	3	59 040 (41 110-86 000)	3 (408)	3:0	2 (41)
Wales	1	68 000	1 (76)	0:1	1 (75)
Total	52	57 289 (14 150-119 800)	49 (4403)	37:12	25 (1047)

A&E=accident and emergency department.

Table 2 Percentage changes in presentation rates for self poisoning in first three weeks after broadcast of index episode of *Casualty*

	Weekly No of cases/centre (95% CI) in 3 weeks before broadcast	Percentage change (95% CI) in presentation rates compared with 3 weeks before broadcast; P value of difference			
		1st week after	2nd week after	3rd week after	Average
Paracetamol overdoses:	5.6 (4.5 to 7.0)	19 (-2 to 44); P=0.08	23 (5 to 43); P=0.01	-6 (-22 to 15); P=0.6	12 (-3 to 30); P=0.13
Males	2.5 (2.0 to 3.3)	24 (-8 to 68); P=0.16	19 (-5 to 49); P=0.12	-11 (-33 to 17); P=0.4	11 (-11 to 37); P=0.3
Females	3.1 (2.5 to 3.9)	15 (-4 to 36); P=0.12	25 (2 to 54); P=0.03	-1 (-17 to 18); P=0.9	13 (-1 to 29); P=0.08
Non-paracetamol overdoses:	8.9 (7.0 to 11.4)	12 (0 to 25); P=0.05	1 (-12 to 17); P=0.9	-6 (-17 to 7); P=0.3	2 (-7 to 12); P=0.6
Males	4.5 (3.5 to 5.8)	1 (-13 to 18); P=0.9	-6 (-22 to 14); P=0.6	-12 (-26 to 5); P=0.15	-5 (-18 to 9); P=0.4
Females	4.4 (3.4 to 5.7)	23 (5 to 44); P=0.008	8 (-10 to 30); P=0.4	1 (-17 to 22); P=1.0	11 (0 to 22); P=0.05
All overdoses:	15.7 (12.9 to 19.2)	17 (7 to 28); P<0.0005	9 (0 to 19); P=0.05	-4 (-14 to 6); P=0.4	7 (0 to 15); P=0.05
Males	7.6 (6.2 to 9.4)	14 (1 to 28); P=0.04	1 (-10 to 14); P=0.8	-11 (-22 to 3); P=0.12	1 (-8 to 12); P=0.8
Females	8.1 (6.6 to 10.0)	20 (8 to 34); P=0.001	17 (3 to 32); P=0.01	2 (-10 to 15); P=0.8	13 (5 to 21); P=0.001

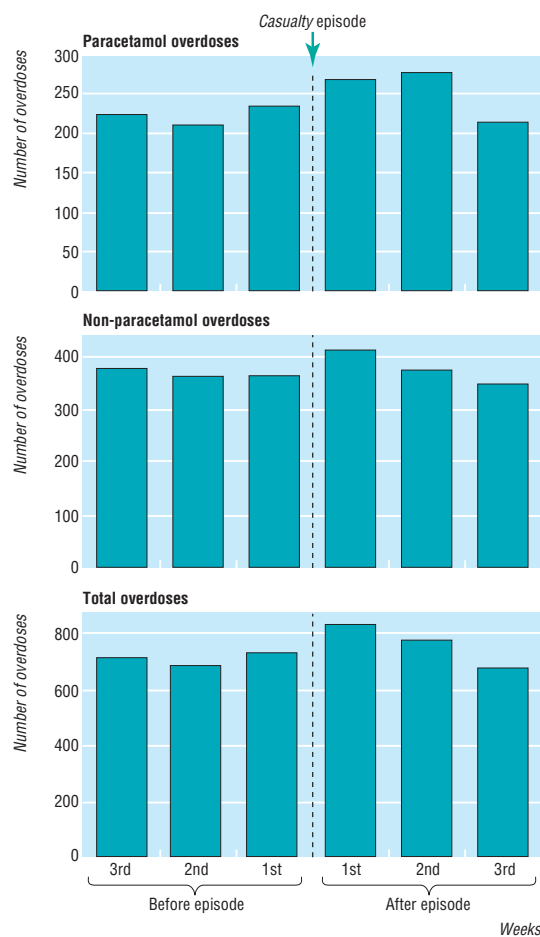
Data provided by accident and emergency departments and psychiatric services showed similar increases (relative risk = 1.01; 95% confidence interval 0.81 to 1.26). There was little difference between centres that collected questionnaire information and those that did not (relative risk = 1.07; 0.93 to 1.23).

Attendances by sex, age, and drug taken in overdose

During the baseline period, 52% of the patients were female; 36% were aged <25, 30% were aged 25-34,

Table 3 Modelled percentage change in presentation rates for self poisoning after broadcast of index episode of *Casualty* by patients' age, sex, and type of drug

Age of patients (years) by type of drug used	Percentage change in presentation rates in 3 weeks after broadcast compared with 3 weeks before	
	Males	Females
Paracetamol:		
<25	4	14
25-34	14	25
>34	4	14
Other substances:		
<25	6	16
25-34	-20	-12
>34	6	16



Numbers of presentations to participating centres for overdose in the three weeks before and three weeks after transmission of the index episode of *Casualty*. (Total number of overdoses is more than the sum of paracetamol and non-paracetamol overdoses because 7 hospitals could not supply details of drugs taken)

and 34% were aged ≥35; and 38% of overdoses included paracetamol (table 3). Females showed a somewhat larger increase in attendance rates than males (relative increase in females compared with males was 12%; -1% to 28%). Those aged 25-34 showed significantly different changes in attendance rates after the broadcast compared with the other age groups: their increase in paracetamol overdoses was greater (P=0.005), and non-paracetamol overdoses declined (P=0.002). The other age groups showed small but similar increases for both types of overdose.

Deaths in England and Wales from paracetamol poisoning

We compared the numbers of deaths from paracetamol poisoning in the three weeks before the broadcast with those in a three week period lagged one week after the broadcast to account for the delay between paracetamol ingestion and death. There was no evidence of increases in mortality after the broadcast (ratio of number of deaths before to number after was 14:15 for suicide, 14:8 for undetermined cause, 6:3 for accidents, and 34:26 combined). Use of a three day lag or no lag gave similar results.

Questionnaire information

Twenty five hospitals supplied completed questionnaires on 1047 individual patients (table 1). Questionnaires were returned for 55% (1047/1917) of patients in the hospitals who supplied weekly attendance or referral counts and questionnaires. Table 4 shows that viewing of *Casualty* by overdose patients in the baseline period was slightly below official BBC figures for those episodes (average of 16% v 22%). In the week after the broadcast 18% of overdose patients had seen the episode (P=0.18 compared with before the broadcast)

while the official BBC figure remained at 22%. Few patients reported that their choice of drug for self poisoning was influenced by television programmes in general (table 4). *Casualty* viewers attending after the episode were slightly more likely to state that general television viewing influenced their choice of drug than those attending before the broadcast (14% *v* 6%, $P=0.10$).

Of the patients who had seen the index broadcast, 15% reported that viewing the episode had influenced their decision to take an overdose. The same number stated that it had influenced their choice of drug, usually in the direction of taking paracetamol (for example: "I saw what happened to him—he died. Thought I'll try it next time I get into trouble" "Knew what tablets to take"). However, some patients said that they had avoided paracetamol because the episode highlighted the dangers of liver damage (for example: "I didn't want to wake up with liver damage and have a slow death"). Ten percent said viewing the episode had influenced their speed of seeking help after the overdose.

Comparison of viewers before and after the broadcast

In the patients who viewed the index *Casualty* episode there was a doubling in the number taking pure paracetamol compared with *Casualty* viewers in the three weeks before the episode (table 5). There was little change in the choice of drug among non-viewers. Most patients presented within 12 hours of taking their overdoses, and this did not change among *Casualty* viewers after broadcast of the index episode. There was also no evidence that viewing the index episode encouraged those without a history of self poisoning to take an overdose or those who had never used paracetamol for self poisoning to do so.

Discussion

Portrayal of a paracetamol overdose in a popular television drama seems to have been followed by significant increases in presentations to general hospitals because of self poisoning. Increases of 17% and 9% were noted in the first and second weeks after the broadcast, and presentations returned to pre-broadcast levels in the third week. Increases were found for both paracetamol and non-paracetamol overdoses. There was no evidence of an impact on deaths from paracetamol poisoning, but this is not surprising as mortality from paracetamol overdose is relatively low.²¹

The increase in self poisoning rates was largest in 25-34 year olds, the age group that included the man who took the overdose in the index episode. Females were more likely to be *Casualty* viewers and showed somewhat greater increases than males. Of the patients who completed questionnaires after the broadcast, 63% of *Casualty* viewers were female compared with 52% of non-viewers. The proportion of females among viewers mirrors national rates (61%).

Casualty viewers might be more aware of paracetamol as a dangerous means of overdose because of their general interest in medical matters.²² However, after the broadcast the proportion of patients who were *Casualty* viewers and used paracetamol for self poisoning doubled—an important finding strongly suggesting that viewing the episode had influenced the choice of substance.

Methodological issues

Several methodological considerations should be noted in interpreting the increase in overdoses after the index *Casualty* episode. It seems unlikely that awareness of the study hypothesis could have influenced data collection since much of the data were

Table 4 Responses to questionnaire for patients presenting with overdoses in the three weeks before and the three weeks after broadcast of index *Casualty* episode. Values are numbers (percentages) of those who responded to question unless stated otherwise

	3 weeks before broadcast			3 weeks after broadcast		
	3rd week	2nd week	1st week	1st week	2nd week	3rd week
Demographics:						
No of patients	187	190	186	194	163	127
Sex ratio (male:female)	85:97	69:119	100:80	93:99	72:87	47:77
Median (range) age in years	31 (12-90)	29 (13-83)	31 (12-89)	30 (13-70)	30 (7-82)	27.5 (13-82)
Method of overdose:						
Pure paracetamol tablets*	45 (24)	73 (38)	49 (26)	62 (32)	71 (44)	48 (38)
Pure paracetamol or paracetamol compound*	91 (50)	102 (54)	89 (48)	91 (49)	89 (55)	65 (51)
Delay from paracetamol overdose to presentation (hours):						
<6	61 (76)	73 (75)	65 (76)	69 (78)	56 (73)	42 (70)
6-12	11 (14)	10 (10)	8 (9)	12 (14)	8 (10)	9 (15)
>12	8 (10)	14 (14)	12 (14)	7 (8)	13 (17)	9 (15)
Overdose history:						
Previous overdose	93 (56)	102 (58)	79 (46)	88 (50)	70 (47)	61 (52)
Previous paracetamol overdose	50 (30)	51 (29)	34 (20)	51 (29)	40 (27)	32 (27)
Television viewing habits:						
Saw last episode of <i>Casualty</i>	22 (15)	23 (15)	26 (17)			
Saw index episode of <i>Casualty</i>				32 (18)	23 (18)	14 (13)
General television viewing influenced choice of drug	5 (3)	6 (4)	2 (1)	7 (4)	5 (4)	6 (6)
Opinions among those who watched <i>Casualty</i>:						
General television viewing influenced choice of drug	(n=22) 1 (5)	(n=23) 2 (9)	(n=26) 1 (4)	(n=32) 3 (10)	(n=23) 4 (17)	(n=14) 3 (21)
Index episode influenced decision to take overdose				6 (20)	2 (9)	2 (14)
Index episode influenced choice of drug				5 (17)	3 (13)	2 (14)
Index episode influenced speed of seeking help				3 (10)	1 (5)	3 (21)

*Includes those who also took non-paracetamol drugs.

Table 5 Comparison of viewers and non-viewers of *Casualty* who presented with overdoses before and after broadcast of index episode. Values are numbers (percentages) of those who responded to question unless stated otherwise

	Non-viewers		Viewers		Percentage change (95% CI) in 3 weeks after broadcast compared with 3 weeks before; P value of difference*
	3 weeks before broadcast (n=375)	3 weeks after broadcast (n=346)	3 weeks before broadcast (n=71)	3 weeks after broadcast (n=69)	
Method of overdose:					
Pure paracetamol	114/371 (31)	124/339 (37)	17/71 (24)	34/69 (49)	106 (28 to 232); P=0.003
Pure paracetamol or paracetamol compound	193/371 (52)	179/339 (53)	34/70 (49)	38/69 (55)	13 (-12 to 56); P=0.5
Pure paracetamol or knew paracetamol was in compound	164/186 (88)	148/172 (86)	26/31 (84)	36/38 (95)	13 (-5 to 34); P=0.2
Delay from paracetamol overdose to presentation (hours):					
<6	139 (74)	127 (74)	28 (85)	28 (74)	χ^2 test, P=0.3
6-12	23 (12)	22 (13)	2 (6)	5 (13)	
>12	26 (14)	21 (13)	3 (9)	5 (13)	
Overdose history:					
Previous overdose	188/363 (52)	160/329 (49)	41/71 (58)	35/67 (52)	-10 (-33 to 23); P=0.6
Previous overdose included paracetamol	95/146 (65)	88/122 (72)	27/35 (77)	26/32 (81)	5 (-18 to 35); P=0.8

*P values calculated with Fisher's exact test except where indicated otherwise.

based on routinely collected information. Also, the three centres with established monitoring systems (Bristol, Derby, and Oxford) noted increases in total overdoses in the period after the broadcast, and increases in paracetamol overdoses were noted in Derby and Oxford (Bristol did not report data on overdose substances).

Although there was extra media attention to paracetamol poisoning around the time of the broadcast, a review of television programmes, newspapers, and magazines revealed no specific focus on paracetamol within a few days of the actual broadcast, so it seems unlikely that other publicity could have triggered the increase. An overdose depicted in the television soap *Brookside* on 8 November (six days after the index *Casualty* episode) did not specify the substance taken and had an audience of only about a third that of *Casualty*.

It is possible that viewing the index *Casualty* episode encouraged people who subsequently took overdoses to go to hospital, especially those who took paracetamol. However, the lack of difference between the viewers and non-viewers in the delay before presentation makes this unlikely.

The questionnaire data add considerably to the strength of the findings. Questionnaires were completed for only about half of the overdose patients in participating centres, but this seems a reasonable figure as many patients in this population self discharge, some cannot be seen by the psychiatric serv-

ice because of early discharge or delays, and others refuse to answer research questionnaires.²³⁻²⁵ Among those responding, nearly a fifth of those who presented in the week after the index *Casualty* episode reported having seen it, and a fifth of these said that it had influenced their decision to take an overdose. Of those who had seen the episode, 17% said that it had influenced their choice of drug, usually in the direction of taking paracetamol but sometimes the opposite. This illustrates the complex nature of media influences on suicidal behaviour.

Conclusions

Our findings about short term changes in presentations for self harm are in keeping with those of an earlier study in adolescents in the United States,¹⁰ and raise serious concerns about the facilitating effect on suicidal behaviour of media portrayals of self poisoning or self injury. This is especially so for popular soap programmes. In addition to being associated with an increase in self harming behaviour, media portrayals seem to influence the choice of method, which is particularly dangerous if it concerns a method such as paracetamol overdose.

Those responsible for writing and producing such programmes must take this seriously. It is questionable whether methods of self harm should be portrayed. Media producers should consider how their clearly influential role could be used to encourage help seeking in those at risk and hence contribute to prevention of this major health problem. Joint production of consensus guidelines about this matter by media staff, researchers, and clinicians would be an important step in the right direction.

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Key messages

- This study found that portrayal of self poisoning in a popular television drama was associated with a short lived increase in presentation of self poisoning patients to general hospitals
- Choice of substance taken in overdose was also influenced by the broadcast
- Extreme caution should be exercised about portraying suicidal behaviour on television, and especially about giving details of the method used
- The potential role of television in preventing suicidal behaviour requires investigation

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A memorable patient All in the family

In the early 1950s I was a registrar at the special unit for juvenile rheumatism, a part of the Canadian Red Cross Memorial Hospital, Taplow, Buckinghamshire. This general hospital also housed adult cardiac patients. In those more leisurely days a morning coffee break was customary to discuss patients, research, and other projects. On one such break I presented my chief, Paul Wood, who was then the eminent British cardiologist, with an electrocardiogram for his opinion. After a quick glance he said "a classical inferior infarct, what's the problem?" I replied that the problem was that the patient happened to be a 10 year old girl with rheumatic fever. Wood blanched, threw his coffee at me, and changed the subject.

Some years later I was telephoned at the Institute of Cardiology by my opposite number at the Hammersmith Hospital to ask if I

remembered this girl. He told me that her brother had just been diagnosed as suffering from the newly described asymmetrical hypertrophy of the heart and he was investigating the family for any familial trend and found my former patient. This condition had recently been recognised from necropsy studies by Donald Teare.¹ Clinical recognition was in its early stages and my girl's electrocardiogram changes were typical of the pathology, now better known as hypertrophic obstructive cardiomyopathy or HOCM, which has a strong familial prevalence.

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