Nurses' responses agreed poorly with the notes for both patients intended to be resuscitated and those not intended for resuscitation. The table shows the agreement with orders in medical notes, but the findings were similar when the nursing notes were taken as the authority.

Comment

Do not resuscitate orders were written in a limited number of formats. This compares well with the multitude of different symbols and code words found in a recent Swedish report.[2] However, the time since the order was last written was long and may have accounted for some confusion. In 15% of decisions where there was a do not resuscitate order the nurses thought that the patient was to be resuscitated. More worryingly, nearly 18% of nursing decisions were not to resuscitate when there was no documented evidence to support this action. This puts nurses in a serious medicolegal position.[3] Some of this difference was due to poor knowledge of the patients' status, but some may reflect poor documentation by doctors in the notes and poor doctor to nurse communication rather than a medical intention actively to resuscitate those patients. Aarons and Beeching showed that only a few patients actually perceived as unsuitable for resuscitation had do not resuscitate orders.[4] Likewise, following legislation in New York State on withholding cardiopulmonary resuscitation the percentage of patients dying without resuscitation but with written do not resuscitate orders increased dramatically (from 22% to 93%) without altering the incidence of resuscitation attempts at the time of death.[5]

This study highlights the problems of documenting resuscitation status and communicating these orders between doctors and nurses. Doctors need to communicate and document their views about resuscitation status more clearly and more often. Raising the priority of resuscitation status at nursing handover would encourage doctors to do that.

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Resuscitation skills of MRCP candidates

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Research has shown that survival to hospital discharge may be directly linked to the attending doctor's knowledge of correct treatment of a lethal arrhythmia coupled with availability of equipment and coordination.[1] We assessed the resuscitation skills of 30 senior house officers and registrars in medicine who were taking the second part of the membership of the Royal College of Physicians (MRCP) examination.

Methods and results

Thirty British doctors took the Oxford University and Region postgraduate medical education MRCP (II) clinical course at Reading. They were selected from 120 applicants, chosen on academic merit and having been successful in passing part I of the MRCP examination on their first or second attempt. They had no or only one previous attempt at part II of the examination. All were active members of cardiac arrest teams in their hospitals.

Management of cardiac arrest was evaluated for 10 minutes by providing the candidate with a scenario of a hospital patient in cardiac arrest. The situation was simulated using a Laerdal Arrhythmia Annie. A Physio Control Lifepak 6s defibrillator was available and was connected to a Heartsim rhythm simulator. Stand ins for nurse and anaesthetist performed tasks as directed by the candidate. The "patient" presented in cardiac arrest with ventricular fibrillation and one further rhythm of cardiac arrest—for example, pulseless ventricular tachycardia, asystole, or electromechanical dissociation.

Twenty nine candidates neglected fundamental rules for the management of cardiac arrest. Six out of 30 candidates correctly followed the resuscitation procedure according to the 1989 guidelines of the Resuscitation Council.[1] Basic life support skills of the other 24 candidates were inadequate (wrong hand position, gastric massage, lack of knowledge of the basic ABC, and failure to check the pulse correctly). Twenty nine candidates did not remove the glyceryl trinitrate patch from the manikin's chest before defibrillation. Such a patch should be removed if the patient is defibrillated as there is a risk that it will cause burns.

Drug treatment given by the candidates deviated from the Resuscitation Council's guidelines, with incorrect use of adrenaline, calcium chloride, and lignocaine infusions in 19 out of the 30 candidates. Poor knowledge of the order of events in the ventricular fibrillation algorithm was seen in 24 candidates. Twenty candidates used an incorrect frequency and energy of shock, and eight did not handle the defibrillator safely. Six used an incorrect basic life support ratio, and the knowledge of the treatment of the other rhythms of cardiac arrest was inadequate in 22 candidates.

Nineteen of the 30 MRCP candidates subsequently went on to pass the actual MRCP (II) examination.

Comment

Several studies have looked at the resuscitation skills of the general public, nurses, medical students, house officers, and hospital consultants.[2] These studies draw the same conclusion: basic life support skills are of poor quality. Our study highlights the lack of knowledge of not only basic life support skills in 29 out of 30 hospital doctors taking the MRCP examination but also a lack of knowledge of the Resuscitation Council's guidelines for arrest management, drug treatment, and electrical treatment. These doctors were at a level of seniority where they conduct resuscitation procedures, and might be assumed to be the most skilled at resuscitation of the groups listed above.

The poor performance of the candidates may be attributed to inadequate teaching during their undergraduate and postgraduate years. The Royal College of Physicians working party proposed that medical staff

be appropriately trained according to their position and specialty.[3] Basic life support training was held to be mandatory for all. The working party recommended that a resuscitation training officer be appointed in every acute hospital solely to ensure that training is implemented and cardiac arrests are regularly audited. It has been shown that cardiac arrest survival can be directly correlated with the availability of resuscitation equipment and the expertise of the team called to the arrest.[4]

This sample of 30 MRCP candidates, of whom 63% went on to pass the MRCP examination, were unfamiliar with Resuscitation Council (UK) guidelines. Regular training and familiarisation with the revised (1992) European Council Resuscitation guidelines will save more lives. Resuscitation experience without feedback increases confidence, not skill.[5] There is no longer a question of whether it is necessary to train medical staff in these skills: it is imperative that they have regular, compulsory training in resuscitation.

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Semen quality of Finnish men

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A recent report highlighted the worldwide decline in mean sperm counts in semen (from 113×10⁶/l to 66×10⁶/l) during the past 50 years.[1] In that report Finnish men were cited as having some of the highest sperm counts recorded.[2] In this paper we review other studies measuring sperm counts in Finland and examine reasons for the decreased sperm counts worldwide.

Subjects, methods, and results

We traced six Finnish studies of semen quality in a total of 849 men. The men were either of proved fertility or were normal but of unknown fertility. The results are given in the table. Common routine methods of semen analysis had been used throughout.

In the earliest study—of 189 fathers examined because of a congenital malformation in their children—only the total sperm count was given (378×10⁶/l).[3] Taking 3·4 ml as the presumed mean semen volume,[1] however, we calculate the mean sperm count as 111×10⁶/l. Nikkanen reported on 21 men destined for vasectomy,[2] and the 56 men studied by Suominen *et al* were also fertile.[4] Saaranen *et al* reported on 144 normal men who were trying to conceive[5] (category 2[1]). The two most recent studies comprised 300 semen donor candidates[6] and 139 men with proved fertility.[7]

Comment

The mean sperm count of the Finnish men (114×10⁶/l) was nearly double that of men worldwide.[1] Even more pronounced was the difference in total sperm count—456×10⁶/l[2 4-7] compared with 182×10⁶/l.[1] No significant decrease in sperm counts was evident in the last two to three decades.

The worldwide decline in sperm counts reported by Carlsen *et al* was not significant after 1964.[1] Linear regression analysis (BMDP 6D bivariate computer program) of studies in 1965-90[1] gives a regression line of $y = 62{\cdot}9 + 0{\cdot}348x$ ($n = 13\,180$; $r = 0{\cdot}140$; $p < 0{\cdot}001$), showing a weak correlation but opposite to that found for the whole period, 1938-90.[1]

Besides possible environmental factors,[1] one reason for the halt in the decline in sperm counts in the 1960s might be the revolution in birth control methods, which allowed more sexual freedom and shorter abstinence periods. The observed decrease in the mean semen volume from 3·4 ml to 2·75 ml[1] accords with this. A Finnish study from 1955[8] indicated considerably longer sexual abstinence than the present four or five days.[2 5 7]

Detailed epidemiological studies are needed to determine whether differences in sperm counts between Finnish men and men worldwide are genetic or environmental. Interestingly, the highest sperm counts recorded in Finland were in men from the rural lake district,[5] and the already low incidence of testicular cancer in Finland is especially low in rural areas (incidence in 1987-91, 10 cases per million inhabitants compared with 30 cases per million in big cities (Finnish Cancer Registry)). These findings strongly suggest that urban lifestyle or other environmental factors may be important in the aetiology of testicular malfunction and disease.

Reported semen characteristics in fertile or normal Finnish men

Study	Year	No of men	Mean days of abstinence	Mean semen volume (ml)	Mean sperm count (×10⁶/l)	Fertility
Takala[3]	1958	189	ND	ND	111*	Fertile
Nikkanen[2]	1979	21	4·4	4·2	131	Fertile
Suominen *et al*[4]	1983	56	ND	5·0	112	Fertile
Saaranen *et al*[5]	1986	144	4·0	3·2	145	Normal†
Iirola and Niemi[6]	1991	300	ND	4·1	96	Normal†
Wichmann[7]	1992	139	5·0	4·2	124	Fertile

*Total sperm count given (378×10⁶/l), volume approximated (3·4 ml).
†Normal unselected men, fertility not proved.
ND=Not determined.

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