Successful resuscitation of sudden cardiac death

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Successful resuscitation of sudden cardiac death: education matters

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Sudden cardiac death (SCD) is a leading cause of death, being responsible for up to one in five deaths in Western countries. It can be described as an unexpected death due to a cardiovascular cause, with coronary heart disease being the most common underlying aetiology. In spite of improvements in the treatment and prevention of SCD, the rate of survival following its occurrence is still low. Therefore, SCD remains a large burden globally.[1] This burden, however, is unequally distributed among the population. For instance, it has been found that people of low socioeconomic status have a higher incidence rate of SCD than people of high socioeconomic status.[2] A good understanding of the socioeconomic disparities with regard to the incidence and outcomes of SCD is essential if we strive to effectively reduce its burden on society.

In the study in this issue of *Heart*, Møller *et al* investigated the effect of socioeconomic status on survival after out-of-hospital cardiac arrest (OHCA). Additionally, they sought to determine whether this effect is mediated by differences in rates of bystander cardiopulmonary resuscitation (CPR) across levels of socioeconomic status. They included all 21 480 patients who had OHCA from the Danish Cardiac Arrest Registry from 2001 to 2014 above 30 years of age and divided them into quartiles based on their income. What they found was that the patients with the highest incomes had up to 26% higher survival rates than those with the lowest incomes. They also found that patients with higher incomes had higher chances of bystander CPR. What was surprising, however, is that most of the income disparity in survival was not due to the difference in chances of bystander CPR. In fact, the latter only accounted for less than 1% of the difference in survival across the income groups.[3] Another, probably more likely, explanation for the observed difference in survival, mentioned by Møller *et al*, is the quality of the intervention as performed by the bystander.

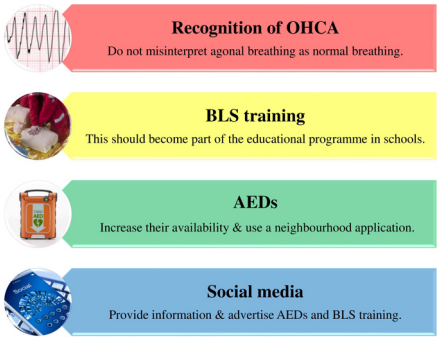

Figure 1 Four steps for the improvement of the quality of bystander intervention. If successfully implemented, these steps have the potential to increase survival following sudden cardiac death in people of all socioeconomic positions. AED, automated external defibrillator; BLS, basic life support; OHCA, out-of-hospital cardiac arrest.

Similar findings were obtained when categorising patients based on their level of education.[3]

The study conducted by Møller *et al* shows that survival following SCD depends on one's socioeconomic status, among other factors. Reducing the socioeconomic disparity in survival seen in these patients should be high on the agenda of all stakeholders. Several steps can be taken to achieve this goal. Considering the fact that the different survival rates are not so much due to the difference in chances of bystander CPR, it would be more probable for the quality of bystander intervention to be an important explanatory factor. After all, if a medical doctor were to suffer from a sudden cardiac arrest, he or she has a relatively high chance of being helped by someone who is experienced in performing CPR and using an automated external defibrillator (AED). Consequently, the quality of bystander intervention will most likely be high. This might not be the case for someone with a lower socioeconomic position, whose social circle might not have been trained to perform high-quality CPR. Therefore, it is of major importance to improve the quality of bystander intervention, especially among people with a relatively low level of education and socioeconomic status. The following steps can facilitate the realisation of this aim (visualised in figure 1):

1. *Increase recognition of OHCA*: prior to the initiation of any intervention by a bystander is the recognition of a cardiac arrest. This can sometimes be difficult due to the presence of gasping breaths, commonly referred to as agonal breathing, which a bystander might misinterpret as normal respiration.[4] However, recognition is the gateway to the rest of the chain of survival and, indeed, to survival itself. Thus, it is crucial for the public to learn to recognise a cardiac arrest. This can be achieved not only by such things as basic life support (BLS) training but also by providing information through other means, including social media and television commercials aiming to raise awareness of the signs of a cardiac arrest. The latter two have the potential to reach a much wider audience, probably also targeting people with a low socioeconomic position.
2. *BLS training*: an important way to improve the quality of bystander intervention is BLS training. This should become a standard part of the educational programme in primary schools as well as in secondary schools, similar to fire drills. Since most people have had primary education, this is a good and effective way of educating a large proportion of the population in BLS and, by doing so, reducing the socioeconomic disparity in survival following SCD. Special attention should be paid to such things as adequate depth and rate of chest compressions and keeping interruptions to a minimum so as to ensure high-quality CPR.[4] Simple educational strategies can be employed to teach this to people. For example, the song 'Stayin' Alive' by the Bee Gees is a simple way of ensuring the correct rate of chest compressions. In addition to this, it is of utmost importance to make people skilled in handling an AED, because the latter has proven to be an important lifesaver.[5] As an alternative to regular CPR training, virtual reality could perhaps be used as a training tool. Although this might be able to reach a wider audience, the resulting CPR quality is still lower than that achieved by face-to-face training. Therefore, further improvements are necessary before implementing virtual reality as an alternative to regular BLS training.[6]
3. *Increase availability of AEDs and people skilled in performing CPR*: nothing would be more regrettable than some-

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one knowing how to use an AED but not being able to use it due to a lack of availability. Therefore, AEDs should be positioned in strategic locations, in public places as well as in neighbourhoods. An application could be used to connect inhabitants of a neighbourhood, allowing for the AED to be used quickly and CPR to be performed by skilled people. For instance, in the Netherlands, as soon as the dispatch centre receives a call because of the occurrence of an OHCA, neighbourhood helpers receive a message stating the address and the location of the patient but also of a nearby AED. This might help to reduce the socioeconomic disparity in survival following SCD and increase survival in all patients regardless of their socioeconomic position.

4. *The importance of social media*: the major influence of social media on the public can and should be used in the fight against SCD. One option would be to advertise AEDs and BLS training. However, there is another, probably more effective, way of changing the status quo. Influencers are in a position to effectuate change by encouraging the public to follow a training course in BLS and emphasising the importance of AEDs.

The key to the effective implementation of these measures is collaboration of the stakeholders involved. Government policies promoting the education of the general public and aiming to improve the quality of bystander intervention constitute an important step towards the reduction in the socioeconomic disparity in SCD survival. For example, governments should subsidise the purchase of AEDs, so that their availability will increase. Medical professionals constitute another major contributing party. Similar to a regular blood pressure check, physicians could inquire whether their patients are skilled in BLS and the use of an AED and offer them the opportunity of BLS training. Finally, the power of social media and television commercials should not be underestimated, because they are capable of reaching a wide audience. Therefore, these should be used as platforms to educate as many people as possible.

Although the treatment and prevention of SCD have improved, further steps are necessary to increase survival following SCD in people of all socioeconomic positions. The most important of these is education. Nelson Mandela once said, 'Education is the most powerful weapon which you can use to change the world'.[7] Thus, let us use education to create a world wherein SCD survival does not depend on one's socioeconomic position.

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