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Doctor, my father is no longer the same!

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How many times did you happen to hear this sentence from your patients' relatives after a surgical operation and anaesthesia? I bet many. And it is often true. Some patients seem to recover perfectly from a purely medical point of view, but there is something wrong and families toil to recognize their beloved ones. But what is wrong?

Usually it has to do with a clinical phenomenon known nowadays as postoperative cognitive dysfunction (POCD). POCD represents a very hot field of research to date, but it is a long time now, since 1955 [1], that we realized that what we do to save patients' life and wellbeing, can potentially hurt them.

It is difficult to generalize and find common features, because the forms that this phenomenon can take are varied and its manifestations are subtle. Anyway, the most commonly seen deficits regard the domains of memory, attention, and information processing. These are cross-functions, and thus fundamental for every-day life and patient's independence and even safety [2].

Though it is generally a transient disturbance, research has demonstrated that POCD is associated with poorer recovery, increased utilization of social financial assistance and higher mortality at one year from discharge [3, 4]. Not bad for a transient disturbance.

Some risk factors have been identified, which regard anaesthesia (long-acting anaesthetic, disturbance of homeostasis, intra- or postoperative complications), operation (extensive surgery, intra- or postoperative complications, secondary surgery) and patient (pre-existing disease, preoperative mild cognitive impairment, low educational level, alcohol abuse, advanced age) [5]. In particular, patients over age of 60 seem to be at risk of developing a POCD, even if it can arise at any age. In the work from Płotek and colleagues in this issue [6], for example, phonological impairment was found more severe in patients older than 35 years. They also found this deficit to last over 6 hours postoperatively (in terms of speed processing), but we know that POCD may last even up to six months. Or more. Despite the initial fast recovery, an "early" postoperative cognitive dysfunction may become a long-term decline at an accelerated rate, or even dementia [7], in susceptible individuals [8].

Though POCD is clearly an heterogeneous and sometimes subtle phenomenon, its clinical relevance is evident and we should begin to use our (still limited) knowledge to improve peri- and intraoperative patient's care.

First, particular attention should be given to selected populations of patients, known to be at risk, and not only medical, but also pre- and postoperative neuropsychological support should be routinely provided to them. Most of the times the cognitive impairment goes unseen, if not studied, because it is very hard to recognize a slowdown in reaction times in a young normal patient without testing him/her. Nonetheless, slow reflexes can put the patient in danger when discharged.

Also, an intact cognitive status should be included in the discharge criteria for every patient. A tool that allows to screen quickly and reliably for POCD should be developed, taking into account the specific characteristics of a clinical setting. A classical neuropsychological evaluation could last up to two or three hours, and this is not conceivable for a routine screening test in a hospital ward.

Anyway, the best thing we could do is to prevent. The best, but also the most difficult in this case, because the mechanisms that lead to cognitive deficits after anaesthesia and surgery are not yet fully understood. Most probably, a key role is played by the immune response to surgery and preventive medication to lessen brain inflammatory response could be a strategy [9]. But also the type of surgery and the duration of anaesthesia seem to affect the patient's cognitive outcome. The least invasive surgery possible is

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preferable especially in elderly patients with preoperative mild cognitive decline.

The neurotoxicity of all routinely used anaesthetic drugs is known [10]. Introducing a brain function monitor for the depth of anaesthesia in clinical daily practice could facilitate anaesthetic titration without overdosing and, therefore, stem its neurotoxic effects as much as possible. Such devices have already demonstrated their usefulness in diminishing the incidence of postoperative delirium, the cousin of POCD, by reducing the anaesthetic exposure [11]. Some evidences already suggest that brain monitors could be a strategy to control also for precipitating factors in the development of postoperative cognitive dysfunction.

Grant me one last reflection. As Płotek and colleagues write in their paper, "modern anaesthetic administration, which affects cognitive processing and nervous system activity, provides an opportunity to control human consciousness in a reversible manner" [6]. In this sentence, I believe, is contained the essence of what modern anaesthesiology and medicine should be: an interdisciplinary profession, strictly linked not only, it is obvious, to biology and physiology, but also to psychology. As long as medicine will be made by people for people, psychology will be an important part of it, both operator- and patient-oriented, providing insights on human factor. And vice versa, anaesthesia is a fruitful field of research for psychology: it is the perfect experimental model to study consciousness and its correlates.

The work from Płotek and colleagues [6] that you can find later on in this issue, is a successful example of such collaboration between anaesthesia and psychology. It will surely make the reader reflect on the importance to push on interdisciplinary research, especially on topics such as postoperative cognitive dysfunction, that can have severe consequences on patients' quality of life, but our knowledge for its effective prevention or therapy is still limited.

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