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Commentary to the article "Neuromuscular blockade in the elderly"

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Sir,

With great interest, we read the review paper entitled "Neuromuscular blockade in the elderly" written by Dr. Michał Stankiewicz-Rudnicki, published in issue 4/2016 of *Anaesthesiology Intensive Therapy* [1].

The selection of medication for the patient stems from — among others — the patient's age and limitation of organ function associated with it, affecting drug metabolism and excretion. Despite this, the selection of neuromuscular blocking agent often results from the necessity to use an agent with the shortest possible time until achieving maximum blockade. Having considered its numerous side effects, succinyldicholine's position — as a drug of choice during rapid induction of anaesthesia — is becoming weaker, with its place being replaced by rocuronium [2, 3]. The use of rocuronium in elderly people is associated with a significantly extended duration of the neuromuscular blockade [4, 5]. The author noticed it is a neuromuscular blocking agent that is currently the most often used in the world. In this context, it is surprising that the author did not express his opinion regarding an agent which could significantly reduce the risk of residual neuromuscular transmission blockade (postoperative residual curarisation — PORC), namely sugammadex. Potentially, this is a neuromuscular blockade reversing agent which could entirely eliminate the incidence of this phenomenon [6].

Therefore, we would like to supplement this publication with a few remarks related to sugammadex use in the elderly. In 2011, in an issue of the journal *Anaesthesiology*, McDonagh *et al.* [7] assessed sugammadex's efficiency and safety in terms of reversing the neuromuscular blockade in a group of patients above 65 years of age. The study included 150 patients, of whom 62 were between 65 and 74 years of age, and 40 were 75 years old or older. The biggest difference the authors managed to observe was the extension of the muscle strength return period (expressed as an increase in the TOF (train of four) rate above 0.9), by 0.7 minute in the group of patients older than 65. This result was attributed to decreased circulatory system dynamics, and the resulting

delay in drug distribution present in elderly people. Similar conclusions were reached by Suzuki *et al.* [8] who compared the return period for muscle strength after using sugammadex in patients between 20 and 50 years of age, as well as those older than 70, and Turkish authors who assessed the effect of age on muscle strength return after using sugammadex in patients between 65 and 74, as well as those older than 75 years of age [9]. In all of the cited articles, age did not affect the presence of side effects, while the medication was considered to be well-tolerated. It is interesting that none of the authors found it necessary to adjust the sugammadex dosage to their patients' age. However, the authors of a recently published article in "Basic & Clinical Pharmacology & Toxicolology" had a different position, as they assessed the efficiency of sugammadex depending on the administered dose and patients' age. They reached a conclusion that in cases of a necessity to reverse a deep neuromuscular blockade in elderly people, it is necessary to increase its dose by 1 mg kg^{-1} of body mass, compared to the dosage suggested by the drug's manufacturer [10]. Another aspect of sugammadex use in elderly people worth stressing includes its potential effect on the occurrence of postoperative cognitive impairment and confusion. Avoiding administering agents affecting acetylcholinergic transmission in the brain is associated with the theoretical possibility of reducing this complication's incidence. Unfortunately, at the moment there is no data which could prove such effect, while the available related knowledge is scarce [11, 12]. Lastly, we would like to stress two crucial aspects of sugammadex use, regardless of patients' age. Firstly, its use cannot mean that an anaesthesiologist is be free to abandon in-depth and objective assessment (resulting from monitoring) of neuromuscular blockade depth as the lack of this can result in an unexpectedly high incidence of PORC [13]. Secondly, despite the temptation to do so resulting from the high price of this drug, one should avoid administering it at doses lower than recommended, as this poses a risk of experiencing a time-delayed residual neuromuscular transmission block [14].

In conclusion, sugammadex, when one both maintains appropriate monitoring and remembers the rules of using it in the elderly, may be considered as a proven and safe medication, allowing one to reduce the risk of developing PORC and its consequences in patients in this age group.

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