Intravenous provocation with Neuromuscular Blocking Agents in the investigation of perioperative anaphylaxis – preliminary findings from the Danish Anaesthesia Allergy Centre(DAAC).

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Background and Goal of Study

Neuromuscular blocking agents(NMBA) are the most common culprits in perioperative anaphylaxis(PA) in many countries. As there is cross reactivity within NMBA's, testing with several drugs is needed to identify a safe alternative. Investigation of PA comprise in-vitro and skin testing, but due to the skin irritant properties of NMBA's the sensitivity and specificity of NMBA skin tests are debated.
In drug allergy investigation provocation tests are "Gold Standard", however it is not routine in PA.
In DAAC, the national reference center for investigation of PA, drug provocation has been routinely performed for most drugs since 2004. Since 2016 provocations have been performed with NMBA's in patients with negative or doubtful skin tests to ensure the highest accuracy of PA investigations. The aim of this study is to present the preliminary findings of this extended investigation program.

Materials and Methods

From 2004-2017 554 patients were investigated in DAAC. Since 2016 in total 49 NMBA provocations with the 4 NMBA's available in Denmark have been performed. Patients are fully monitored(ECG, saturation, BP), have nasal oxygen and anesthetic back up is available. Titrated provocation is done in 3 ten-fold steps up to a maximum of 1/10 of a full dose: cisatracurium 1 mg, suxamethonium 5 mg, rocuronium 5 mg, mivacurium 2 mg. Highest doses are given over 5-20 minutes by a trained anesthesiologist, and patients are closely observed for signs of allergy or effects of NMBA.

Results and Discussion

In the 554 patients 261 tests were positive; main culprits being antibiotics, chlorhexidine and patent blue. Only 14 tests (5,4%) were positive for an NMBA on skin testing. One patient out of 49 NMBA provocations in patients with negative or doubtful skin tests, had a positive provocation test. None of the patients experienced any NMBA effects at doses of 1/1000 and 1/100. Most patients experienced transient visual disturbance and two patients (both elderly ladies) had transient disturbance of tongue movement. None experienced respiratory difficulties or desaturation.

Conclusion

Due to the skin irritant properties of NMBA's skin testing may be difficult to interpret and may lead to false positive results restricting future choice of NMBA. This study shows that low dose provocation with NMBA's is safe and well tolerated by patients. It should still be considered a high-risk procedure which should only be performed in highly specialized centers.