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Case Study

Peri-operative Anaphylaxis in University Hospital Limerick; An Audit and Quality Improvement Project

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Abstract

Background: Anaphylaxis is defined as "a severe life-threatening generalised or systemic hypersensitivity reaction" [1]. An audit is conducted following a severe case to establish the extent to which current best practice guidelines on anaphylaxis were being followed in the perioperative setting in this hospital.

Methods and Results: The standards for this audit was set using The 6th National Audit Project of the Royal College of Anaesthetists (NAP 6) 2018 on Perioperative Anaphylaxis and compliance with these standards was assessed in a total of nine theatres within our anaesthetic department. None of our theatres (0%) had an anaphylaxis management algorithm clearly visible. Only one of nine (11%) of theatres evaluated had an anaphylaxis specific treatment pack and no theatre had an anaphylaxis investigation pack. All theatres (100%) had vasopressin and glucagon readily available. A dedicated departmental lead for perioperative anaphylaxis was in place leading to 100% compliance with this audit standard.

The authors retrospectively examined anaphylaxis cases encountered in UHL during July 2019/2021. It was a total of 3 cases with no mortality. Only 30% of cases was sent to a local Allery centre.

Conclusion: The results of this audit highlight ways in which improvements can be made to increase awareness and to ensure patient safety. This audit was extended to a hospital wide quality improvement project with the setting up of anaphylaxis treatment and investigation packs in the perioperative, critical care and ward settings. In addition to this the authors run simulations sessions for NCHDs and Nurses.

Keywords: *Anaphylaxis; Vasopressin; Glucagon*

Introduction and Case Study

Editor-Anaphylaxis is defined as "a severe life-threatening generalised or systemic hypersensitivity reaction" [1]. This is characterised by rapidly developing life-threatening airway, breathing and/or circulation problems usually associated with skin and mucosal changes. Anaphylaxis is one of the most dangerous emergencies encountered in the perioperative setting and is associated with significant mor-

bidity and mortality. A recent case of perioperative anaphylaxis was encountered by the project lead. This prompted the conduction of an audit the goal of which was to establish the extent to which current best practice guidelines on anaphylaxis were being followed in our hospital.

The standards for this audit was set using The 6th National Audit Project of the Royal College of Anaesthetists (NAP 6) 2018 on Perioperative Anaphylaxis and compliance with these standards was assessed in a total of nine theatres within our anaesthetic department [2]. None of our theatres (0%) had an anaphylaxis management algorithm clearly visible wherever anaesthesia was administered. Only one of nine (11%) of theatres evaluated had an anaphylaxis specific treatment pack and no theatre had an anaphylaxis investigation pack as recommended by NAP 6. All theatres (100%) had vasopressin and glucagon readily available. A dedicated departmental lead for perioperative anaphylaxis was in place leading to 100% compliance with this audit standard.

Antibiotics are now the most common trigger of anaphylaxis during anaesthesia. The most common presenting features of perioperative anaphylaxis are hypotension followed by bronchospasm/high airway pressure, tachycardia, flushing and oxygen desaturation [3]. Early recognition and specific treatment of anaphylaxis is key to avoiding harm. Recognition of anaphylaxis is unfortunately often delayed. Adrenaline is the primary treatment of anaphylaxis and it is recommended in all the published treatment guidelines [3-10]. It should be administered immediately once anaphylaxis is suspected and in the perioperative setting this is usually intravenous.

Departmental preparedness for management of perioperative anaphylaxis is imperative. Only 35% of hospitals surveyed in the UK had a Departmental lead appointed [2]. So, in relation to compliance with this recommendation our hospital performed well. It is current best practise to have vasopressin and glucagon available within 10 minutes wherever anaesthesia is administered and we also had 100% compliance with this recommendation. Administration of Vasopressin 2 units repeated as necessary should be considered when hypotension due to perioperative anaphylaxis is refractory [5,10]. The benefit of adrenaline is likely to be reduced in the presence of beta blockade. European guidelines [2] and Australian/New Zealand guidelines [10] recommend glucagon 1-2 mg every 5 minutes until response. However, the findings of NAP 6 were that these drugs are rarely used in perioperative anaphylaxis resuscitation [2]. Reasons proposed for such poor usage included lack of immediate availability or knowledge of the location of these drugs. New UK resuscitation council guidelines emphasise that Antihistamines are considered a third-line intervention and should not be used to treat Airway/Breathing/Circulation problems during initial emergency treatment. And Corticosteroids are no longer advised for the routine emergency treatment of anaphylaxis [8].

Areas identified by this audit where improvements could be made included the immediate provision of anaphylaxis guidelines. Current guidelines recommend that perioperative anaphylaxis guidelines or at least a management algorithm should be immediately available wherever anaesthesia is administered [3,10]. None of the theatres assessed had anaphylaxis guidelines or a management algorithm immediately visible however there were anaphylaxis guidelines available in a folder nearby in the recovery area. Following recommendations made by this audit a laminated sheet with the Resuscitation Council UK 2021 guidelines on anaphylaxis was installed in each theatre in a dedicated 'Anaphylaxis Kit'. In addition none of the theatres assessed by this audit had anaphylaxis specific packs. This is not an infrequent finding as only 50% of hospitals surveyed in the UK in 2017 had these packs in theatres [2]. Two types of specific Anaphylaxis packs to facilitate prompt early treatment and investigation are recommended [2]. These packs need to be available wherever anaesthesia is administered. The anaphylaxis treatment pack should include an anaphylaxis management algorithm, adrenaline pre-filled syringes suitable for intravenous administration, adrenaline ampoules 1:1000 for preparation of infusion in refractory cases and details of the location of glucagon and vasopressin. An anaphylaxis investigation pack should include tryptase sampling tubes, information describing details of blood tests required and instructions on referral for further investigation and a letter to GP [2]. The authors retrospectively examined anaphylaxis cases encountered in UHL during July 2019/2021. It was a total of 3 cases with no mortality. Only 30% of cases was sent to a local Allery centre.

Following recommendations made by this audit work an 'Anaphylaxis Kit' including treatment and investigation packs were installed in every theatre. The audit was further extended to a hospital wide quality improvement project with the setting up of the 'Anaphylaxis Kit' in the perioperative, critical care and ward settings. In addition to this the authors are currently involved in organising hospital wide staff training on anaphylaxis management using video simulation teaching methods. It is envisaged that these actions will facilitate early administration of adrenaline and efficient investigation of perioperative anaphylaxis which will definitively improve outcomes and possibly saves lives.

Conclusion

The results of this audit highlight ways in which improvements can be made to increase awareness and to ensure patient safety. This audit was extended to a hospital wide Quality Improvement Project with the setting up of anaphylaxis treatment and investigation packs in the perioperative, critical care and ward settings. In addition to this the authors run simulations sessions for NCHDs and Nurses.

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Declaration

No conflict of interest.

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