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Antisialogogues Commonly Prescribed In Children Undergoing Dental Treatment Under General Anaesthesia- A Retrospective Study

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Abstract

Introduction: Antisialogogue are drugs that reduce the production of saliva and produce opposite effects to sialogogues. These drugs are considered in procedures as they produce a good field for surgeries and help in reducing the salivary flow rate of the child in order to treat the patient effectively. These drugs are available as both natural and synthetic. Most commonly they are used in cases of RCT and extraction. Commonly used anti-sialogogue drugs include glycopyrrolate and atropine.
Aim: Aim of the study is to find out the commonly prescribed antisialogogue in children undergoing dental treatment under General anaesthesia.
Materials and Methods: This is a retrospective study. Data of the patients were collected from the dental hospital management system. Total of 88 samples were collected according to the inclusion criteria. The collected data was tabulated based on the age and type of antisialagogue used for the patients. The tabulated data were converted to variables and the data was imported to SPSS. The data were statically analysed and results were obtained accordingly.
Results: In the present study, 1-3yrs (59.09%) of age have been the highest percentage of the children treated under antisialogogues and glycopyrrolate (70.45%) is the commonly used antisialagogue drug for treating patients under general anaesthesia.
Conclusion: Under the limitation of the study it is concluded that the most commonly used anti-sialogogue in dental treatment under general anaesthesia is glycopyrrolate.

Keywords: Antisialagogue, Hyper salivation, Saliva, Innovative technique

INTRODUCTION:

General anaesthesia is a drug inducing loss of consciousness during the situation in which the patient cannot feel the pain (1). General anaesthesia is commonly used to facilitate dental treatment on relieving the anxiety and challenging behaviour of the patient (2). General anaesthesia is considered to be the cost effective and most practical mode of treating a paediatric patient (3) (4) (5) in safer conditions (6). In any complicative procedure (7) (8) (9) or a treatment to an uncooperative child that needs administration of general anaesthesia (10). Paediatric patients with physical, mental immaturity and younger age are treated under general anaesthesia (11) in order to maintain the patient during treatment (12). In cases of treating a child on general anaesthesia the pre-anaesthetic evaluation (13)(14) is seen to be important or it may lead to complications of the general anaesthesia like toxicity, injury to the eye, hepatotoxicity, masseter spasm, hyperkalemia and hyperthermia (15).

Antisialogogue drugs are anticholinergic drugs which act by inhibiting the parasympathetic nervous system (16). Antisialogogues are drugs which help in reducing the salivary flow rate (17)(18). Increased production in the saliva causes inconvenience in treating a patient in case of dental treatment such as extraction and RCT (19). These drugs are available as natural or synthetic drugs. These drugs are often used in the management of the noisy breathing and excess
production of mucous fluid from bronchial secretions (20).

Antisialogogues mostly preferred are atropine (17)(21), glycopyrrolate and scopolamine. Most common drug used is atropine and glycopyrrolate and the route of administration is intravenously, just before administration of anaesthesia (22). Glycopyrrolate and atropine available in injectable form that can be given as an indication in the reduction of saliva in preoperative secretion state (21). The main antisialagogue drug preferred is glycopyrrolate in the form of oral, intravenous, intramuscular routes (23). Glycopyrrolate helps in reducing saliva production from 4 to 8mg reduction on administration before 3 and 6 hours. Most common side effects in using these drugs are xerostomia and other effects include enlargement of pupil, fast heart rate, urinary retention and constipation (24). The use of anti-sialogogues have reduced due to the adverse effects like xerostomia and other side effects. Adverse effects of these drugs also include mild effects on the heart rate and usual accommodation but in cases of high dosage causes bradycardia (25). These drugs are seen to be used to reduce the chair time but some studies show it does not have any impact on the chair time (26). On certain comparisons on studies on the antisialogogues the usage of glycopyrrolate is preferred more compared to the other antisialogogues. The use of antisialogogues are even preferred after knowing the highlighted minor side effects but they are not used routinely (16). Aim of the study is to find the commonly used antisialogogue in dental treatment under general anaesthesia.

MATERIALS AND METHODS:

A retrospective study was conducted in a private dental college among the dental patients visiting the clinic between the age of 1-12 years (paediatric patients) in Chennai. Data of the patients were collected from the dental hospital management system. Patient details were collected between September 2020 and February 2021 out of which 300 samples were taken on both the inclusion and exclusion criteria. The inclusion criteria included antisialogogues and age between 1-12yrs. 88 samples that fulfilled the inclusion criteria were included in the study. Ethical approval was obtained from the Institutional review board prior to starting the research.

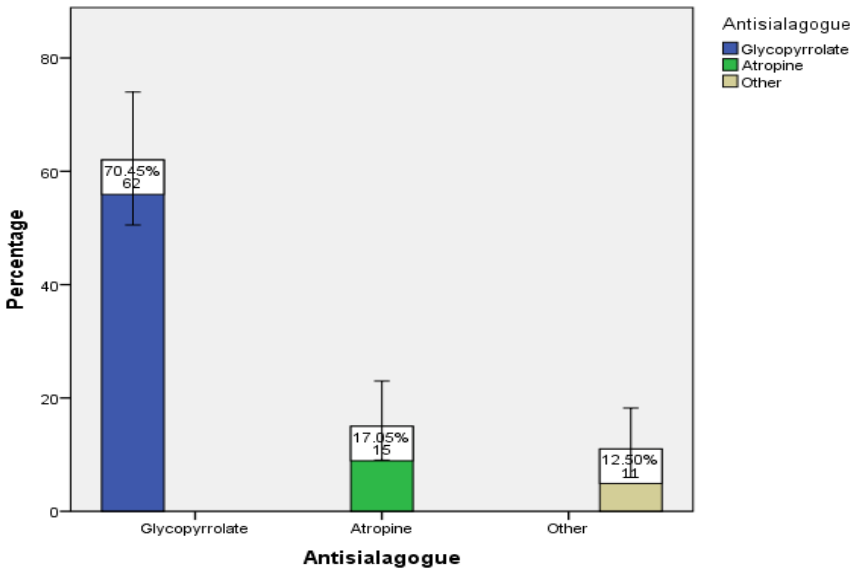
After the cross verification by the reviewer. The collected data was tabulated based on the age and type of antisialagogue used for the patients. The tabulated data were converted to variables and the data was imported to SPSS. Using the SPSS software version 20.0 the variables were expressed as percentages and frequency and bar graphs were plotted accordingly. The statistical significance of the association of age and type of antisialogogues used in treating paediatric patients.

RESULTS:

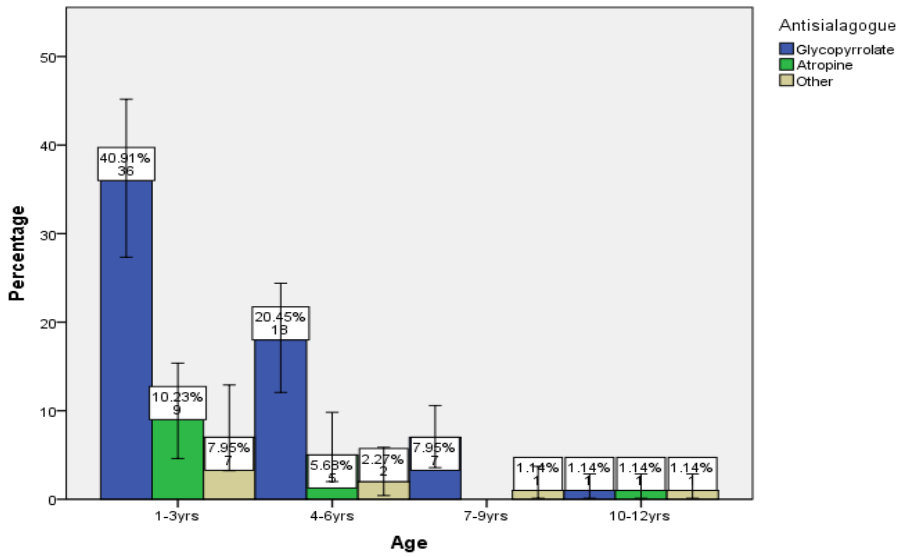
A total of 88 children who were treated under antisialogogues with general anaesthesia were included in the study. The mean value of the age group of the children underwent treatment with antisialogogues was 1.57±0.799 years. The demographic details of the participants of the study along with the antisialogogue drug used are tabulated in table 1. Glycopyrrolate was the most commonly prescribed antisialagogue. (Graph 1) Association between the age group and the type of antisialagogue used showed no significant difference after calculating the p value and analysing that is represented in graph 2.

Total	N=88	
Age	Mean ± Standard deviation	1.57±0.799
Antisialagogue	Glycopyrrolate	70.45% (n=62)
	Atropine	17.05% (n=15)
	Others	12.50% (n=11)

Table 1: Table represents the total number of subjects included in the study, percentage of the antisialogogues and the mean value of the age of the subjects.



Graph 1, represents the commonly used anti-sialogogues in the paediatric practices in dental treatment. The percentage and count represented in Y axis and the antisialagogue used is represented in X axis. The commonly used anti-sialogogues in the paediatric practices in dental treatment along with general anaesthesia showed the majority of responses was the use 70.45% of glycopyrrolate which is blue colour compared to 17.05% of atropine which is green colour and 12.50% of others which is peach colour.



Graph 2, represents the relation of the age and the type of antisialogogue used. Comparing the graphs it can be seen that (1-3yrs) shows the majority count of patients treated which is 40.91% and in that category the commonly preferred drug is glycopyrrolate which is 40.91%. Chi square test was done and association was not significant (p value - 0.625;p >0.05) proving there was no statistical significant association between the age and the type of antisialagogue used along with general anaesthesia.

DISCUSSION:

Mostly the anaesthetist would always use an anticholinergic drug in preanaesthetic medication in children and the atropine is almost universally used. In the present study it was found that atropine was given in 17.05% of cases. The article also stated the use of the common atropine and glycopyrrolate showed an increase in the heart rate in paediatric patients. Glycopyrrolate is considered to afford better protection in this aspect to the treatment and at the same time it is associated with less serious change in the cardiac rhythm (27). Warren P in his study stated that several researches show that glycopyrrolate is more effective and potent than atropine as an antisialagogue (28). These studies show that the use of atropine and glycopyrrolate is highest among antisialogogues and from that the safer one and preferred one is considered to be glycopyrrolate.

CONCLUSION:

General anaesthesia is the most common type of sedation given to a child of younger age group or a child that is uncooperative for a complicated procedure. Under the limitation of the study it can be concluded that the commonly used antisialogogues in the dental treatment under general anaesthesia is glycopyrrolate.

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CONFLICTS OF INTEREST:

No conflicts of interest

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REFERENCE:

1. Dougherty N. The dental patient with special needs: a review of indications for treatment under general anesthesia [Internet]. Vol. 29, Special Care in Dentistry. 2009. p. 17–20. Available from: http://dx.doi.org/10.1111/j.1754-4505.2008.00057.x
2. Lim MAWT, Borromeo GL. The use of general anesthesia to facilitate dental treatment in adult patients with special needs. J Dent Anesth Pain Med. 2017 Jun;17(2):91–103.

3. Ravinthar K, Gurunathan D. Applicability of Different Mixed Dentition Analyses among Children Aged 11-13 Years in Chennai Population. Int J Clin Pediatr Dent. 2020 Mar-Apr;13(2):163–6.

4. Gandhi JM, Gurunathan D. Short- and long-term dental arch spatial changes following premature loss of primary molars: A systematic review. J Indian Soc Pedod Prev Dent. 2022 Jul-Sep;40(3):239–45.

5. Suguna S, Gurunathan D. Quality of life of children with sleep bruxism. J Family Med Prim Care. 2020 Jan;9(1):332–6.

6. Thikkurissy S, Crawford B, Groner J, Stewart R, Smiley MK. Effect of passive smoke exposure on general anesthesia for pediatric dental patients. Anesth Prog. 2012 Winter;59(4):143–6.

7. Sruthi S, Jeevanandan G, Govindaraju L, Subramanian E. Assessing quality of obturation and instrumentation time using Kedo-SG blue, Kedo-SH, and reciprocating hand K-files in primary mandibular molars: A double-blinded randomized controlled trial. Dent Res J . 2021 Sep 25;18:76.

8. Priyadarshini P, Jeevanandan G, Govindaraju L, Subramanian EMG. Clinical evaluation of instrumentation time and quality of obturation using paediatric hand and rotary file systems with conventional hand K-files for pulpectomy in primary mandibular molars: a double-blinded randomized controlled trial. Eur Arch Paediatr Dent. 2020 Dec;21(6):693–701.

9. Lakshmanan L, Somasundaram S, Jeevanandan G, Subramanian E. Evaluation of Postoperative Pain after Pulpectomy using Different File Systems in Primary Teeth: A Systematic Review. Contemp Clin Dent. 2021 Mar 20;12(1):3–8.

10.Kotian N, Subramanian EMG, Jeevanandan G. Comparing the Sedative Effect of Oral and Intranasal Midazolam and their Effect on Behavior in Pediatric Dental Patients. Int J Clin Pediatr Dent. 2022 Jan-Feb;15(1):128–34.

11.Govindaraju L, Subramanian E, Jeevanandan G. Comparing the Influence of Conventional and Rotary Instrumentation Techniques on the Behavior of the Children: A Randomized Clinical Trial. Int J Clin Pediatr Dent. 2021;14(Suppl 2):S179–85.

12.Ramazani N. Different Aspects of General Anesthesia in Pediatric Dentistry: A Review. Iran J Pediatr. 2016 Apr;26(2):e2613.

13.Kotian N, Mani G, Ramakrishnan M. Comparative Evaluation of Two Different Topical Anesthetic Agents in Controlling Pain during Intraoral Local Anesthetic Administration in Children: A Split-mouth Triple-blinded Randomized Clinical Trial. Int J Clin Pediatr Dent. 2021 Mar-Apr;14(2):180–2.

14.Janiani P, Gurunathan D. Effectiveness of Pre-administered Natural Sweet-tasting Solution for Decreasing Pain Associated with Dental Injections in Children: A Split-mouth Randomized Controlled Trial. J Contemp Dent Pract. 2021 Dec 1;22(12):1434–7.

15.De Francisci G, Papasidero AE, Spinazzola G, Galante D, Caruselli M, Pedrotti D, et al. Update on complications in pediatric anesthesia. Pediatr Rep. 2013 Feb 5;5(1):e2.

16.Mirakhur RK, Clarke RS, Dundee JW, McDonald JR. Anticholinergic drugs in anaesthesia. A survey of their present position. Anaesthesia. 1978 Feb;33(2):133–8.

17.Diamant H, Feinmesser M. Atropine as an antisialogogue, compared with l-hyoscyamine (bellafoline), scopolamine butylbromide (buscopan) and oxyphenonium (antrenyl). Br J Anaesth. 1959 May;31(5):205–9.

18.Ahmed MA, Ashfaq Ahmed M, Jain AR, Varma ACU. Knowledge, Attitude and Practice regarding Antisialogogue drugs in Dental Management [Internet]. Vol. 10, Research Journal of Pharmacy and Technology. 2017. p. 3489. Available from: http://dx.doi.org/10.5958/0974-360x.2017.00624.2

19.Leone J, Georgievski Z, Koklanis K. Atropine Treatment of Amblyopia: Is a Swap in Fixation Necessary? [Internet]. Vol. 47, Journal of Pediatric Ophthalmology & Strabismus. 2010. p. 270–6. Available from: http://dx.doi.org/10.3928/01913913-20091118-05

20.van Esch HJ, Geijteman ECT, van der Rijt CCD. Response to "Hyoscine Butylbromide for the Management of Death Rattle: Sooner Rather Than Later." J Pain Symptom Manage. 2019 Apr;57(4):e1–2.

21.Saleh A, Elazzazi H. Comparison between different atropine doses as an antisialagogue for patients receiving ketamine-midazolam undergoing gamma knife radiosurgery [Internet]. Vol. 7, Ain-Shams Journal of Anaesthesiology. 2014. p. 336. Available from: http://dx.doi.org/10.4103/1687-7934.139560

22.Rautakorpi P, Ali-Melkkilä T, Kanto J. Anticholinergic drugs in paediatric anaesthesia. A survey of their present position in Finland 1990. Ann Chir Gynaecol. 1994;83(1):64–8.

23.Gallanosa A, Stevens JB, Quick J. Glycopyrrolate. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2020.

24.Singh S, Loke YK, Furberg CD. Inhaled anticholinergics and risk of major adverse cardiovascular events in patients with chronic obstructive pulmonary disease: a systematic review and meta-analysis. JAMA. 2008 Sep 24;300(12):1439–50.

25.Grandhe S, Babos M. Antisialagogues. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2020.

26.Kuijpers MAR, Vissink A, Ren Y, Kuijpers-Jagtman AM. The effect of antisialogogues in dentistry: a systematic review with a focus on bond failure in orthodontics. J Am Dent Assoc. 2010 Aug;141(8):954–65.

27.Mirakhur RK. Premedication with atropine or glycopyrrolate in children Effects on heart rate and rhythm during induction and maintenance of anaesthesia [Internet]. Vol. 37, Anaesthesia. 1982. p. 1032–6. Available from: http://dx.doi.org/10.1111/j.1365-2044.1982.tb01719.x

28.Warran P, Radford P, Manford MLM. GLYCOPYRROLATE IN CHILDREN [Internet]. Vol. 53, British Journal of Anaesthesia. 1981. p. 1273–6. Available from: http://dx.doi.org/10.1093/bja/53.12.1273