

An Assessment of Parental Knowledge, Attitude and Practices Related to Paediatric Liquid Medications: A Questionnaire Study

Sandeep S¹ Jyothi B² Hitendra. R. Jain^{3*} Priti S⁴ Shashidhar Chandrashekhar⁵ Ashwini A Malve⁶

¹PG Student, Department of Pedodontics and Preventive Dentistry, S.M.B.T Dental College & Hospital, Sanganer, Maharashtra, India.

²Reader, Department of Pedodontics and Preventive Dentistry, S.M.B.T Dental College & Hospital, Sanganer, Maharashtra, India.

³Reader, Department of Public Health Dentistry, S.M.B.T Dental College & Hospital, Sanganer, Maharashtra, India.

⁴PG Student, Department of Pedodontics and Preventive Dentistry, S.M.B.T Dental College & Hospital, Sanganer, Maharashtra, India.

⁵Professor, Department of Pedodontics and Preventive Dentistry, S.M.B.T Dental College & Hospital, Sanganer, Maharashtra, India.

⁶Senior Lecturer, Department of Periodontology, K.B.H. Dental College and Hospital, Nashik, Maharashtra, India.

ABSTRACT

Background: To assess parental knowledge, attitude and practices followed by parents in the use of Pediatric liquid medications (PLM) including common medications used, knowledge of dosages, hidden sugar components, frequency of consumption, side effects and impact on oral health.

Material and Methods: The sample comprised of the parents of 320 children in the age group of 3 to 8 years, visiting the Department of Pediatric and Preventive Dentistry in a dental college in Northern Maharashtra region. The questionnaire covered topics on knowledge of the parents about the liquid medicaments and the attitudes, and practices followed in their administration

Results: Around 256 (80%) parents said that their child preferred PLM's over tablets. Only 8.2% of parents believe that PLM's has side effects on consumption. Most of the parents (78%) shown interest to get a knowledge related to sugar-free medication and precaution taken after liquid sugar-containing medication

Conclusions: Parental knowledge about PLM's use is confined and limited. Inadvertent and injudicious use of PLM's should be avoided. Parents have shown positive attitude in relation to obtaining further information about PLM. Parents should be well informed about PLM's proper usage, side effects and alternate options available.

Keywords: Dental caries, parents, pediatric liquid medication, sugar.

INTRODUCTION

Pediatric liquid medications (PLM) are quite popular, widely prescribed by pedodontist and paediatricians, more palatable than tablets or capsules and easily available over the counter. Liquid medications can be procured in the form of syrups, solutions, suspensions, and mixtures.^[1] Various advantages/benefits associated with this form of medication are wide acceptance by all age group children, flexibility with dosage, good absorption and ease of availability and administration.^[2]

However, there are certain disadvantages associated with PLM's, which might be overlooked when these are administered for a short period; in case of long-term usage, the risks are magnified. Based on clinical observations since 1953, long term oral medication may lead to rampant dental caries.^[3] As the liquid medicines, contain sucrose as the sweetening agent which possesses high viscosity resulting in low salivary clearance and high cariogenic potential.^[4]

Received: Aug. 13, 2020; Accepted: Oct. 21, 2020

*Correspondence Dr. Hitendra.R.Jain.

Department of Pedodontics and Preventive Dentistry, S.M.B.T Dental College & Hospital, Sanganer, Maharashtra, India.

Email: jainhiten25@gmail.com

Sugar has been widely used in antibiotics and other pediatric medicines to improve their palatability. It is thus an additional source of sugar for pediatric patients, especially those chronically ill, who receive a greater sugar load from liquid medications than healthy children do and, consequently, have high caries prevalence.^[5]

The various factors that contribute to the cariogenic potential of these formulations include the high sugar content, low pH, the duration, and frequency and most importantly the time of administration (Night time administration reduces oral clearance due to decreased salivary flow).^[1] Several in vitro studies have been previously carried out to assess the sugar content, viscosity, pH and cariogenic potential of PLM, but there are few studies to assess the knowledge, attitude, and practices of parents with regard to PLM. This study aims to assess parental knowledge, attitude and practices followed by parents in the use of PLM's including, common medications used, knowledge of dosages, and side-effects and frequency of consumption.

MATERIAL AND METHODS

The present study was a cross-sectional survey among parents of 320 children in the age group of 3 to 8 years, visiting the Department of Pediatric and Preventive Dentistry in a dental college in Northern Maharashtra region by using convenience/non-probability sampling method. Ethical approval was obtained from the Institutional Review board. Written informed consent was obtained from the parents who agreed to participate in the survey & were assured of confidentiality

Data collection method was a questionnaire consisting of 13 closed-ended type questions were given to parents and collected after half an hour of administration, and children of the target group were examined for a deft index. The questions were to test the knowledge of the parents about the liquid medicaments and the attitudes, and practices followed in their administration.

The questionnaire includes regarding the type of drug used, frequency, side effects, and awareness regarding presence of sugar in medicine, oral hygiene measure after intake of medicine and interest in getting knowledge sugar free medication and precaution after taking medication.

A pilot study was carried out on 10% of the desired population in order to check the feasibility and relevance of the prepared format. The questionnaire was tested for its validity and reliability before the main study. The content validity was assessed by a panel of four experts, 2 experts from Public health dentistry speciality and other 2 experts from paediatric dentistry speciality. Aiken's V values thus obtained were 0.89. In order to assess internal validity and reliability of questions, Cronbach's alpha was calculated and found out to be 0.85.

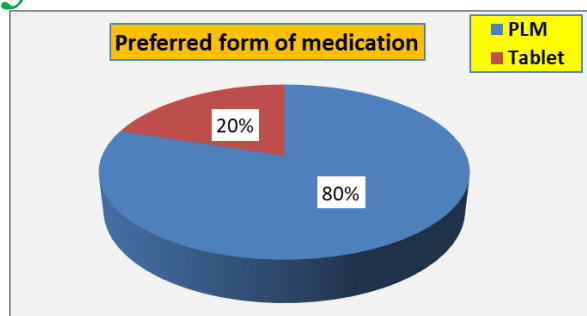
Parents were explained about the questionnaire before they answered the questions. Each parent was given approximately 10 minutes to fill the questionnaire. The completed questionnaire was collected by the same investigator after it is filled on the same day. Statistical analysis was performed using Statistical Package for Social Science (SPSS) version 21 for Windows (Armonk, NY:IBM corp). Descriptive qualitative data were expressed in percentage/proportion.

RESULTS

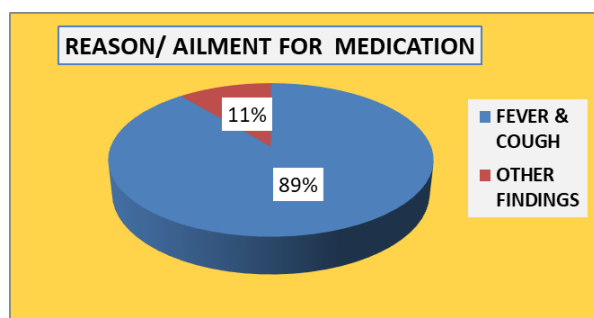
In the study, a total of 320 parents took part. Around 256 (80%) parents said that their child preferred PLM's over tablets and only 64 (20%) parents said the tablet was preferred over syrup by their child. [Graph: 1]. Most parents 230 (71.9%) preferred allopathic medicine, 48 (15%) preferred ayurvedic formulations and 42 (13.1%) parents preferred homeopathic/Unani medications/formulations.

Around 285 (89%) parents said their child suffered from fever and cough since birth until around 6 years old and remaining 35 (11%) said other findings. Very few, 35 (13.6%) of the parents responded that their child was on long-term liquid medication like multivitamins, analgesic (ibuprofen) and some parents said their child on antibiotics [Graph:2]. Out of 320 parents/ study subjects, 96% of parents were able to name (brand name/ generic name) commonly used for their child.

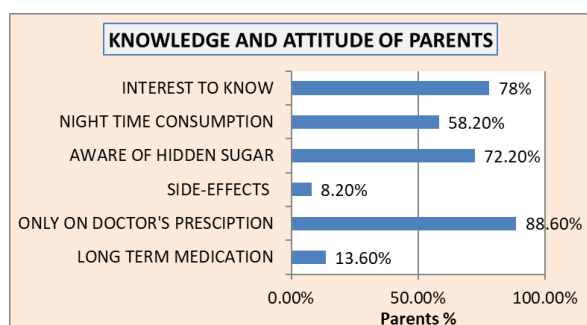
Out of 256 parents, 227 (88.6%) administered medication only on the doctor's prescription and remaining 29 (11.4%) took self-medication or by relatives and friends recommendation. [Graph 3]



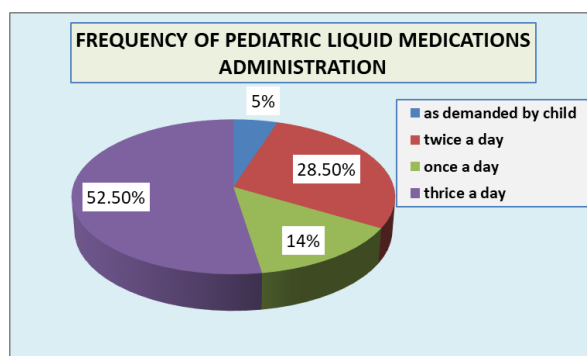
Graph 1: Preferred form of medication.



Graph 2: Reason for medication.



Graph 3: Knowledge and attitude of parents.



Graph 4: Frequency of PLM administration

However, the frequency of administration very few, 13 out of 256 (5%) parents administered the syrups as and when the child demanded, 73 (28.5%) parents said they administered the medication twice a day, 36 (14%) said they

administered it once a day and maximum, 134 (52.5%) parents said they administered it thrice daily. Most of the parents did not have knowledge about the proper dosage of medication. [Graph: 4]

Very few, 21 (8.2%) parents noticed side-effects to the medication like stomach pain and pruritus. No major side-effects of concern were generally noticed by the parents, and all (100%) parent said they don't know about the side effect of liquid medication on oral health. Around 185 out of 256 (72.2%) parents were aware that the PLM's contained hidden sugar.[Graph 3]

Most parents (73%) specified that medication was provided within 30 mins after taking a meal while 27% of parents administered medicines frequently in – between meals. Night-time consumption of medication was reported by 149 (58.2%) of the parents. Maximum 128 (50%) parents did not give any instructions to their child after administration of liquid medication. Only few 71 (27.7%) parents encouraged their child to drink water, and 57 (22.2%) parents rinse the mouth with water and do the cleaning with finger after PLM's. Only 25 (7.8%) parents were aware of non – caloric / sugar-free medications available in the market. Around 200 (78%) parents showed interest to get a knowledge related to sugar-free medication and precaution taken after liquid medication [Graph 3].

DISCUSSION

Parents are the best caretaker in each and every aspect of their own child growth, health and behaviour development.

Pediatric liquid medications are commonly available over the counter and are actively prescribed by paediatricians, pedodontist and general practitioner. In our study, 80% parents said their child prefers PLM's over tablet and capsule, which was in accordance with the study done by Athimuthu A. et al.^[1] showed 75.5%. The children preferred liquid medication due to their palatability and ease of administration.

In this study, 66.6 % parents said that child is suffering from cough and fever since birth to around six years. The WHO Department of Maternal, Newborn, Child and Adolescent Health stated that cough and fever are a common disease in a child

due to bacterial and viral infection because of low immunity.^[6]

However, the frequency of administration, in this study 5% parents administered the syrups as and when the child demanded, 28.5% parents said they administered the medication twice a day, 14% said they administered it once a day and maximum, 52.5% parents said they administered it thrice daily. Some results are in agreement with the study done by Athimuthu A. et al.^[1] showed 26.4%, 35.2%, 14.7% and 23.5% respectively. Most of the parents who took self-medication and by their relative or friends circle person behalf did not have knowledge about the proper dosage of medication.

Subramaniam P et al.^[7] and Pierro VS et al.^[8] a study mentioned that 50% of the PLM's contained sucrose, glucose, sorbitol as a sweetening agent and which increases the palatability of the medication. In this study 72.2% parents are aware of the hidden sugars in liquid medicaments whereas Athimuthu A. et al.^[1] study shows 32.3%. But 100% of parents in our study and 91.2% in Athimuthu A. et al.^[1] study unaware about their implication on the oral and dental health of their child.

More than half of the parents, 58.2% administered the PLM's at night, which is in agreement with Athimuthu A. et al.^[1] study 67.6%. It has been shown that there is reduced salivary flow at night, which reduces the clearance of these medications, thus further increasing the caries risk. In order to reduce the cariogenic potential, the sweetener in these medications can be substituted from sucrose to certain available nonacidogenic sweeteners like polyalcohols (sorbitol, and xylitol). The advantage with these sweeteners being that produce minimal oral pH drop as they are not readily fermented by plaque bacteria. A study conducted by Menten has confirmed that the pH drop associated with the sugar substitutes is lesser than that with sucrose.^[18]

Earlier studies like done by Valdenice AM et al.^[19] and Athimuthu A. et al.^[1] shown that 7.5% and 80% parents do preventive measure like oral cleaning and encouraged a child to drink water or rinse after liquid medication. In this study 50% were not taking any preventive measures after liquid medication. In this study, 78% parents showed interest to get knowledge and practices of the preventive measure after liquid medication and sugar-free medication

which indicate a positive attitude among parents to obtain vital information regarding PLM's.

CONCLUSION

Educate the parents about oral hygiene care after administration of pediatric liquid medications, increased awareness about non-sucrose PLM's and demerits of self-medication. In cases of chronic diseases where medication is important and prolonged use of medicine is required, anticipatory guidance plays a dynamic role in preventing dental caries.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

1. Athimuthu A, Praveen P, Prathibha RS, Ananya R, Selabh ST, Rajeshkrishna M. An assessment of parental knowledge and practices related to pediatric liquid medications and its impact on oral health status of their children. *SRM J Res Dent Sci* 2014 ; 5 (2):87-90
2. Nunn T, Williams J. Formulation of medicines for children. *Br J Clin Pharmacol* 2005;59(6):674-676
3. James PM, Parfitt GJ. Local effects of certain medicaments on teeth. *Br. Med. J.* 1953; 1252-1253.
4. Feigal RJ, Gleeson MC, Beckman TM, Greenwood ME. Dental caries related to liquid medication intake in young cardiac patient. *ASDCJ Dent. Child* 1984;31: 360-362
5. Maguire A, Rugg-Gunn AJ, Butler TJ. Dental Health of children taking antimicrobial and non-antimicrobial liquid oral medication long term. *Caries Res* 1996; 30: 16-21.
6. WHO IMCI distance learning course Module- 9 cough or difficult breathing. 2014: Page 43-45
7. Subramaniam P, Nandan N. Cariogenic potential of pediatric liquid medicaments – An in vitro study. *J Clin Pediatr Dent* 2012;36:357-62.

8. Pierro VS, Abdelnur JP, Maia LC, Trugo LC. Free sugar concentration and pH of pediatric medicines in Brazil. *Community Dent Health* 2005;22:180-183.
9. Feigal RJ, Jensen ME, Mensing CA. Dental caries potential of liquid medications. *Pediatrics* 1981;68:416-419.
10. Passos IA, Sampaio FC, Martínez CR, Freitas CH. Sucrose concentration and pH in liquid oral pediatric medicines of long-term use for children. *Rev Panam Salud Publica* 2010;27:132-137.
11. Sunitha S, Prashanth GM, Shanmukhappa, Chandu GN, Subba Reddy VV. An analysis of concentration of sucrose, endogenous pH, and alteration in the plaque pH on consumption of commonly used liquid pediatric medicines. *J Indian Soc Pedod Prev Dent* 2009;27:44-48.
12. Arora R, Mukherjee U, Arora V. Erosive potential of sugar free and sugar containing pediatric medicines given regularly and long term to children. *Indian J Pediatr* 2012;79:759-763.
13. Xavier AF, Moura EF, Azevedo WF, Vieira FF, Abreu MH, Cavalcanti AL. Erosive and cariogenicity potential of pediatric drugs: Study of physicochemical parameters. *BMC Oral Health* 2013;13:71.
14. Tupalli AR, Satish B, Shetty BR, Battu S, Kumar JP, Nagaraju B. Evaluation of the erosive potential of various pediatric liquid medicaments: an in-vitro study. *J Int Oral Health* 2014;6:59-65.
15. Babu KL, Rai K, Hedge AM. Pediatric liquid medicaments – Do they erode the teeth surface? An in vitro study: Part I. *J Clin Pediatr Dent* 2008;32:189-194.
16. Babu KL, Rai K, Hegde AM. PH of medicated syrups – Does it really matter? – An in-vitro study: Part-II. *J Clin Pediatr Dent* 2008;33:137-142.
17. Lökken P, Birkeland JM, Sannes E. pH changes in dental plaque caused by sweetened, iron-containing liquid medicine. *Scand J Dent Res* 1975;83:279-283.
18. Montes A. pH changes in dental plaque after using sugar-free pediatric medicine. *J Clin Pediatr Dent* 2001; 25:307-12.
19. Valdenice AM, Gabriela C, Cristiana M, Ana FG, Rossana B. Pediatric medicines and their relationship to dental caries. *Braz. J. Pharm. Sci.* 2010;4(1)