

## AN ASSESSMENT OF KNOWLEDGE AND USAGE OF RUBBER DAM AMONG DENTISTS IN A KARACHI SAMPLE

<sup>1</sup>ASMAT JAMEEL

<sup>2</sup>ALINA SHAH

<sup>3</sup>AQSA MUHAMMAD IQBAL

<sup>4</sup>HAFIZ MUJTABA HUSSAIN

### ABSTRACT

*The aim of this study was to evaluate the use of rubber dam during root canal treatment and how to enhance its usage among dentists in Karachi*

*This was a questionnaire based study conducted by Endodontic Department of Jinnah Medical and Dental College. It was conducted from 28 April 2016 to 10 September 2016. The questions were divided into six categories; Demographic data, knowledge, availability, usage, advantages and disadvantages of rubber dam usage during root canal treatment.*

*Total 263 out of 300 responded in which 59% were general dental practitioners, 35.7% were house officers, 25% were specialists. While 55% of house officers, 59% general dental practitioners and only 25% of the specialists used rubber dam during root canal treatment. Overall 12% of the respondent thought rubber dam usage can be promoted through both lectures and workshop while 26.6% opted for lectures, 36.5% through workshops, and 24% by some other means.*

*It was concluded from the current study that the use of rubber dam is less common during root canal treatment among dentists in Karachi, in spite of knowing all the benefits of the rubber dam usage.*

**Key Words:** Rubber dam, Root canal treatment, Isolation, frequency.

### INTRODUCTION

Rubber dam is considered the reference standard in root canal treatments because of the advantage that it offers with regard to infection control, patient safety and enhances success of the treatment.<sup>1</sup> It plays an integral part in increasing the overall quality of dental care.<sup>2</sup> Rubber dam is the ideal tool for tooth isolation during dental therapeutic procedures, it facilitates washing and scrubbing the working field and prevents salivary contamination.<sup>3</sup>

The main advantages of rubber dam usage is that it enables the practitioners for an aseptic working field by excluding saliva, blood and gingival fluid and thus

improves operators visibility and reduce the time of working.<sup>4</sup> It also helps the patient against ingestion or inhalation of endodontic instruments and irrigants; prevent laceration of soft tissue from rotary instrument thus contributing to efficient treatment.<sup>5</sup> A contraindication for the use of rubber dam is if the patient is allergic to chemical constituents of rubber dam, in such cases teeth maybe isolated with polythene bags.<sup>4</sup> The prevalence of rubber dam usage in endodontic treatment varies from 3% to 67% according to different studies.<sup>6</sup> Cochran et al reported that rubber dam usage reduces about 90% to 98% of microorganisms spread during root canal treatments.<sup>7</sup> Many factors like undergraduate training, dentist competence, past dental experience and practice location and resources have been suggested to significantly influence the rubber dam usage.<sup>8</sup>

Conducting a questionnaire study will give an insight into the attitudes and preferences of dentists in Karachi, Pakistan about rubber dam usage during RCT. It also highlight the means through which its usage can be promoted.

### METHODOLOGY

This questionnaire based survey was conducted by Endodontic Department of Jinnah Medical and

<sup>1</sup> Dr Asmat Jameel, Professor Operative Dentistry & Incharge Department of Edodontics, Jinnah Medical & Dental College, # 22, 23 Shaheed-e-Millat Road, PC74000, Karachi  
Email: asmat.jameel@gmail.com

<sup>2</sup> Dr Alina Shah, BDS, Jinnah Medical & Dental College  
Email: alinashah@live.com

<sup>3</sup> Dr Aqsa Muhammad Iqbal, BDS, Demonstrator Periodontics, Jinnah Medical & Dental College

<sup>4</sup> Dr Hafiz Mujtaba Hussain, BDS, Demonstrator Prosthodontics  
Email: mh18596@gmail.com

**Received for Publication:** October 20, 2017  
**First Revision:** December 30, 2017  
**Second Revision:** January 5, 2018  
**Third Revision:** March 2, 2018  
**Approved:** March 6, 2018

Dental College. Duration of the study was from 28 April, 2016 to 10 September 2016. 300 questionnaires were distributed out of which 263 were returned. The study population included house officers, general dental practitioners and specialist of Karachi, Pakistan. Students were excluded from this study due to limited clinical experience. All the study participants fulfilling the criteria were requested to fill the form. The first part of the questionnaire included the demographic data of the participants. The second part of the questionnaire comprised of the questions like knowledge, availability and usage of rubber dam during root canal treatments. Moreover advantages, disadvantages and treatment outcome of rubber dam usage are also included. All the questions were close ended. Questions were checked for ambiguity, content validity and reliability.

## RESULTS

Total number of the sample size was 300. The overall response rate was 263. Out of the 263 dentists who reported, 35.7% were house officers, 59% were general dental practitioner and 25% were specialists. The dentists were divided into four categories, of which 55.9% were below the age of 30, 22.1% below the age of 40, 18.6% below the age of 50 and 3.4% were below the age of 60. Of the total number of participants 57% were male and 43% were female.

Further details of results can be seen in Tables 1-3.

## DISCUSSION

Despite the known benefits of rubber dam usage during RCTs, the use of rubber dam by dentist in Karachi is quite low. Silver et al observed that no other technique, treatment and instrument that is used in dentistry is accepted and advised by recognized authorities and shall so universally ignored by practicing dentist than the use of rubber dam.<sup>1</sup> Endodontic treatment without rubber dam is not standard of care in most developed countries and the advantages of rubber dam are emphasized in the curriculum of dental schools.<sup>2</sup> The results of the current research is in line with the findings of other international reports. As 77.6% have the knowledge of using rubber dam have beneficial effects during endodontic treatment, but in actual only 52% applied during root canal treatment.

In present study it was concluded that young dentist about 55% of the house officers and 59% of the GDPs, tend to use rubber dam more than their seniors 25%. Joynt et al observed that specialists and GDPs had a much higher frequency of rubber dam usage.<sup>4</sup> However according to Mala et al dentist abandon the rubber dam usage after leaving the dental school.<sup>5</sup> According to age wise distribution the usage of rubber dam, dentist below the age of 30 years utilized more than the other categories, which means that young GDPs used it more often. Lynch and Mc Connell reported that respondents aged 30-35 years apply rubber dam

TABLE 1: USE OF RUBBER DAM ACCORDING TO EXPERIENCE OF DENTISTS

Experience	Always	Mostly	Sometimes	Rarely	Never	Total
House Officers	12	13	30	22	17	94
General Dental Practitioners	10	14	40	24	23	111
Specialists	4	7	18	13	16	58
Total	26	34	88	59	55	263

TABLE 2: AFFECTS ON PROCEDURE TIME BY THE USE OF RUBBER DAM

Effects on Procedure	Frequency (n)	Percentage %
Shortens	43	16.3%
Lengthens	123	46.8%
No Effects	97	36.9%
Total	263	100%

TABLE 3: RUBBER DAM USAGE ACCORDING TO PRACTICE

Used in Practice	Institute (n)	Clinics (n)	Both (n)	Total (n)
House Officers	37	55	2	94
General Dental Practitioner	50	33	2	111
Specialists	33	25	0	58
Total	120	139	4	263

more,<sup>6</sup> while in the study of Soldani and Foley, more than 50% of respondents were aged 40-45 years who used rubber dam.<sup>7</sup>

About 48% of the male and 41% of the females uses rubber dam while performing RCTs. Male gender tends to pursue their career more than the females and hence the male ratio is greater in the current study. Similar study was conducted by Martin K and Zdenka S in which male dentist occasionally apply more rubber dam (27%) than the females (16%).<sup>10</sup> While the study conducted in UAE, about 21.7% of the female dentist employ rubber dam while 20.5% males dentists, which concluded that female dentist uses more rubber than males.<sup>11</sup> Various reasons have been cited for the low frequency of usage of rubber dam and the main reason in the present study is insufficient time in which 34.2% of the dentists agreed. However literature suggests that even an inexperienced operator can apply rubber dam in a few minutes<sup>10</sup> In addition, the extra time spent in placing the rubber dam is more than compensated with better working conditions.<sup>10</sup> While results of present study was supported by a study done in UAE in which almost 90% agreed it to be a time consuming procedure.<sup>10</sup> Another reason in studies done at overseas reported that 50% patients don't felt comfortable while undergoing root canal treatment under rubber dam isolation.<sup>8</sup> According to Stewardson, patients actually preferred to have rubber dam placed during RCTs and they find treatment with rubber dam more comfortable and bearable.<sup>9</sup> Sajeev K and Nicholas p stated that the perception of intolerance may be related to the attitude of practitioner more than the patients.<sup>16</sup> Most of the dentists in present study used rubber dam in some of the cases. Same result was reported by Martin K and Zdenka S in which less than 8% of the dentist routinely used rubber dam, less than 22% occasionally used while 70% of the dentist never uses rubber dam while performing RCTs.<sup>10</sup> In a study of Belgian dentists, 65 % reported never or seldom using a rubber dam, and only 7% used a rubber dam in all RCT cases.<sup>11</sup> In a national survey of general dentists in New Zealand, a rubber dam was used routinely during RCT by 57 percent of practitioners.<sup>12</sup> In another study by Mona F A and Gregg H G 44% of general dentists always used a rubber dam during RCT, with another 24% indicating that they used it more than one half of the time.<sup>13</sup>

In the present study the greater part of dentist (77.6%) agreed on the fact that rubber dam increases the success rate of the procedure as it was reported in an article by Anum T and Muhammed A in which 72.8% of the dentist think that RCTs done under rubber dam are successful.<sup>14</sup> Abbot et al evaluated 100 patients, who complained of continuing pain after commencement of RCTs and lack of use of rubber dam in 87% of the cases

was recorded as the major factor for failure<sup>15</sup> but the studies done by UAE, 50% of the dentist think that RCTs with rubber dam is as successful as without.<sup>10</sup> Soladani and Foley maintain that only randomizes controlled trials with long term follow-up are conducted; the question of whether the use of rubber dam improves the quality of dentistry remains unsolved.<sup>16</sup>

Furthermore recently graduated dentists have more knowledge about rubber dam usage and they use rubber dam more frequently than their seniors. As current study results clearly suggest that 80.2% of the house officers while only 19% of the GDPs and 0.8% of the specialists had training in rubber dam usage. Other main finding of this study is that as they become senior they tend to discontinue rubber dam routinely. In a study conducted in Peshawar, 52.5% had been taught both theoretically as well as clinically. 45.5% had only been taught clinically while 2.5% were taught clinically only on how to apply rubber dam.<sup>17</sup> According to Pecioliene V rubber dam is used more frequently by dentists who have been practicing for a shorter length of time.<sup>18</sup>

Rubber dam was widely underused in this study. It seems that dentist needs to be sensitized to rubber dam use through an awareness campaign.<sup>19</sup> Many of dentists also agreed on this ,26.6% dentists agreed to promote its usage only by lectures, while 36.5% dentists wanted its promotion by conducting workshops, 12.9% agreed on doing workshops and attending seminars, but 24.4% wanted its promotion by other means. The ability to place a rubber dam successfully and efficiently comes with experience which in turn comes with regular use.

## CONCLUSION

The use of rubber dam is less common during endodontic treatment in this study, in spite of knowing all the benefits of the rubber dam usage. Mostly young male GDPs uses rubber dam during endodontic treatment. The use of rubber dam is less because they think of it as a time consuming procedure. It is a well-known fact that rubber dam application is mandatory for better prognosis of RCTs, so it should be encouraged through workshops and lectures both.

## REFERENCES

- 1 Anabtawi MF, Gilbert GH, Bauer MR, Reams G, Makhija SK, Benjamin PL, Williams OD, National Dental Practice-Based Research Network Collaborative Group. Rubber dam use during root canal treatment: findings from The Dental Practice-Based Research Network. *The Journal of the American Dental Association.* 2013;28;144(2):179-86.
- 2 Park M, Mah YJ, Ahn BD. Study on adaptability of rubber dam clamps on primary second molars in Korean children. *The Journal of the Korean Academy of Pedatric Dentistry.* 2013;40(2):98-105.
- 3 Madarati AA. Why dentists don't use rubber dam during endodontics and how to promote its usage?. *BMC oral health.* 2016;25;16(1):24.

- 4 Hedge M N, Hedge P. Rubber dam isolation for endodontic treatment and difficult in clinical situation, *Journal of Dental Sciences*, 2014;(2);12.
- 5 Park M, Mah YJ, Ahn BD. Study on adaptability of rubber dam clamps on primary second molars in Korean children. *The Journal of the Korean Academy of Pedatric Dentistry*. 2013;40(2):98-105.
- 6 Patterson CJ. Polydam—polythene sheet, a practical alternative to rubber dam for patients allergic to rubber compounds. *International endodontic journal*. 1989 Sep 1;22(5):252-53.
- 7 Lin HC, Pai SF, Hsu YY, Chen CS, Kuo ML, Yang SF. Use of rubber dams during root canal treatment in Taiwan. *Journal of the Formosan Medical Association*. 2011 Jun 1;110(6):397-400.
- 8 Madarati AA. Why dentists don't use rubber dam during endodontics and how to promote its usage?. *BMC oral health*. 2016 Feb 25;16(1):24.
- 9 Syed Imran S, ShakeelurRehman K. T Use of rubber dam by dental practitioner of Pakistan, 2015;(5); 41.
- 10 Abraham SB, Rahman B, Istarabadi A, Mahmoud AW, Danielle Q. Attitudes towards use of rubber dam in private practices in the United Arab Emirates. *Saudi Endodontic Journal*. 2012 Sep 1;2(3):142.
- 11 Udoye CI, Jafarzadeh H. Rubber dam use among a subpopulation of Nigerian dentists. *Journal of oral science*. 2010;52(2):245-49.
- 12 Hill EE, Rubel BS. Do dental educators need to improve their approach to teaching rubber dam use?. *Journal of Dental education*. 2008 Oct 1;72(10):1177-81.
- 13 Mala S, Lynch CD, Burke FM, Dummer PM. Attitudes of final year dental students to the use of rubber dam. *International endodontic journal*. 2009 Jul 1;42(7):632-38.
- 14 Lynch C D, Mc Connell R J. The use of microabrasion to remove discolored enamel. *J Prosthet Dent* 2009;(0);413-19.
- 15 Soldani F, Foley J. An assessment of rubber dam usage amongst specialists in paediatric dentistry practising within the UK. *International journal of paediatric dentistry*. 2007 Jan 1;17(1):50-6.
- 16 Koshy SA, Chandler NP. Use of rubber dam and its association with other endodontic procedures. *New Zealand Dental Journal*. 2002;98:12-16.
- 17 Stewardson DA, McHugh ES. Patients' attitudes to rubber dam. *International Endodontic Journal*. 2002 Oct 1;35(10):812-19.
- 18 Kapitán M, Sustová Z. The use of rubber dam among Czech dental practitioners. *Acta Medica (Hradec Kralove)*. 2011;54(4):144-48.
- 19 Hommez G, Braem M, De Moor R. Root canal treatment performed by Flemish dentists. Part 1. Cleaning and shaping. *International Endodontic Journal*. 2003;36(3):166-73.
- 20 Koshy S, Chandler NP. Use of rubber dam and its association with other endodontic procedures in New Zealand. *N Z Dent J* 2002; 98(431):12-16.
- 21 Anabtawi MF, Gilbert GH, Bauer MR, Reams G, Makhija SK, Benjamin PL, Williams OD, National Dental Practice-Based Research Network Collaborative Group. Rubber dam use during root canal treatment: findings from The Dental Practice-Based Research Network. *The Journal of the American Dental Association*. 2013 Feb 28;144(2):179-86.
- 22 Tanwir A, Amin M, Choudhry Z, Naz F. Knowledge, attitude and perception of dental fraternity towards practice of rubber dam. *Pakistan Oral & Dental Journal*. 2015 Dec 1;35(4).
- 23 Sivakumar JS, Kumar BN, Shyamala PV. Role of provisional restorations in endodontic therapy. *Journal of pharmacy & bioallied sciences*. 2013;5 (1):120.
- 24 Soldani F, Foley J. An assessment of rubber dam usage amongst specialists in paediatric dentistry practising within the UK. *International journal of paediatric dentistry*. 2007 Jan 1;17(1):50-6.
- 25 Syed Imran S, ShakeelurRehman K. T. Use of rubber dam by dental practitioner of Pakistan, 2015;(5); 41.
- 26 Peciuliene V, Rimkuvienė J, Aleksejuniene J, Haapasalo M, Drukteinis S, Maneliene R. Technical aspects of endodontic treatment procedures among Lithuanian general dental practitioners. *Stomatologija*. 2010;12(2):42-50.
- 27 Udoye CI, Jafarzadeh H. Rubber dam use among a subpopulation of Nigerian dentists. *Journal of oral science*. 2010;52(2):245-49.

#### CONTRIBUTIONS BY AUTHORS

- |                                 |  |
|---------------------------------|--|
| <b>1 Asmat Jameel:</b>          | Literature search, reviewed the write up, developed the methodology. |
| <b>2 Alina Shah:</b>            | Write up, literature search, conceived the idea.                     |
| <b>3 Aqsa Muhammad Iqbal:</b>   | Literature review, data analysis.                                    |
| <b>4 Hafiz Mujtaba Hussain:</b> | Data collection, literature review.                                  |