

ORIGINAL ARTICLE

EFFECT OF CHRONIC NAIL BITING AND NON-NAIL BITING HABIT ON THE ORAL CARRIAGE OF ENTEROBACTERIACEAE

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ABSTRACT:

Background: Nail biting (NB) is a common, but unresolved, problem in psychiatry, psychology, medicine and dentistry. It is the habit of biting one's nails, is commonly observed in both children and young adults **Materials & Methods:** The study was a comparative cross-sectional microbiological study, conducted on the saliva samples of 40 chronic nail biting subjects in that 20 were males and 20 were females and 40 subjects without chronic nail-biting having male and 20 female subjects with age ranging from 10-16 years. Government and private schools in and around the city were selected. **Results:** The prevalence of enterobacteriaceae was higher in males than females and it was statistically significant E.coli was the most common enterobacteriaceae species found in chronic nail biting subjects **Conclusion:** Chronic nail biting habit was more in males than females. There was higher prevalence of enterobacteriaceae in chronic nail biting subjects than non-nail biters.

Key words: Nail Biting (NB), Enterobacteriaceae species, E.coli, Male Female.

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INTRODUCTION

Nail Biting can be defined as the crossing of any digit from an individual's lips. Operational definition of nail biting is "putting one or more fingers in the mouth and biting on nail with teeth". Nail biting is called onychophagia as well¹. Complications of nail biting include damage to the cuticles and nails, dermatological problems of fingers melanonychia, paronychia, self-inflicted gingival injuries and gingival swelling².

Dentists or dental specialists are usually interested in dental and gingival problems as a result of chronic nail biting^{3,4}. However, the habit of nail biting can result in autoinoculation of pathogens and transmission of infection to distant body parts. For children with inadequate and poor toilet hygiene, enteric bacteria can pose a potential threat and danger by penetrating the body via mouth as a result of nail biting; so they can lead to various infections there. Therefore, determination of prevalence of enterobacteriaceae in the mouths of chronic nail-biters may be useful for clinicians⁵. The predominant aerobic bacterial flora of the large intestines of man and animals is composed of non-sporing, non-acid-fast, Gram-Negative bacilli. They exhibit general morphological and biochemical similarities and are

grouped together in the large and complex family *Enterobacteriaceae*.⁵

This study was conducted to compare the prevalence of Enterobacteriaceae in children's with and without chronic nail biting habit and to compare the prevalence in males and females. It was also assigned to find out the group more prone for chances of disease occurrence. This method of classification as derived from the use of lactose in the MacConkey's medium, but this classification is based on single property and is contrary to modern taxonomical concepts. So, the family is first is classified into group or tribe then into genus, one or more subgenera and species^{5,6}.

Enterobacteriaceae:

Tribe I - Escherichieae

- Genus
1. Escherichia
 2. Edwardsiella
 3. Citrobacter
 4. Salmonella
 5. Shigella

Tribe II - Klebsiella

- Genus
1. Klebsiella
 2. Enterobacter
 3. Hafnia
 4. Serratia

Tribe III -Proteeae

Genus 1. Proteus

Tribe IV -Erwinieae

Genus 1. Erwinia

Enterobacteriaceae families are the most pathogenic and most frequently encountered organisms in clinical microbiology. These families consist of gram-negative, non-sporulating, rod-shaped bacteria and can be found in almost all natural habitats^{7,8}.

They are the causative agents of such diseases as meningitis, bacillary dysentery, typhoid fever and food poisoning. *Escherichia coli* are the most frequently encountered bacterium in clinical microbiology. The infections caused by *E. coli* include intestinal infections, bacteremia, pneumonia, cholecystitis, appendicitis, peritonitis, post-surgery infections, meningitis, and sepsis in premature and neonatal babies, hemolytic uremia and traveler's diarrhea³.

The mouth harbors a diverse abundant and complex microbial community which tends to inhabit both the soft and hard tissues in the form of bio films⁹. However a highly efficient innate host defense system constantly monitors the bacterial colonization and prevents bacterial invasion of the local tissues¹⁰. Accumulating evidence suggests the impact of the dental diseases on the general health of the individual thus warranting a harmonious relation of the microorganisms with that of the oral tissues, albeit any shift in this balanced ecology would unfold a series of events that might result in a disease status.^{11,12}

Reports of foreign bodies in the oronasal complex have included bullets, impression materials, teeth, fish bones, needles, plastics, pistachio nuts, earrings, and the traumatic implantation of a toothbrush. A chronic oral habit can introduce foreign bodies into the oral cavity.^{13,14} Like, Habitual nail-biting (onychophagia) is widespread among children, beginning as early as 4 years and peaking typically between 10 and 18 years.¹³

a) Abnormal oral habits

A habit is a repetitive action that is being done automatically. Repetitive behaviours are common in infantile period and most of them are started and finished spontaneously. One of the most common repetitive behaviours in infantile period is hand sucking¹⁵. As the mouth is the primary and permanent location for expression of emotions and even is a source of relief in passion and anxiety in both children and adults, stimulation of this region with tongue, finger, nail or cigarette can be a palliative action.¹⁶

Oral habits could be divided into 2 main groups:

(1) Acquired oral habits: Include those behaviours which are learned and could be stopped easily and when the child grows up, he or she can give up that behaviour and start another one.

(2) Compulsive oral habits: Consist of those behaviours which are fixed in child and when emotional pressures are intolerable for the child, he or she can feel safety with this

habit, and preventing the child from these habits make him or her anxious and worried¹⁷.

Oral habits are associated with dento-alveolar and/or skeletal deformation in some patients. The amount of dento-alveolar- skeletal deformation is related to the frequency, duration, direction, and intensity of certain habits and should be assessed by the dentist. Changes that can occur to the dento-alveolar structures may include anterior or posterior open bite, interference of normal tooth position and eruption, alteration of bone growth, and cross bites. The dentist can provide the patient and parent with information regarding consequences of a habit. Treatment modalities to control habits may include patient/ parent counselling, behaviour modification techniques, myo-functional therapy, and appliance therapy¹⁸.

b) Nail Biting or Onychophagia

Nail biting (NB) is a common, but unresolved, problem in psychiatry, psychology, medicine and dentistry¹. It is the habit of biting one's nails, is commonly observed in both children and young adults¹⁵. Onychophagy is classified as a nail disease caused by repeated injuries¹⁹.

Definition: The crossing of any digit from an individual's lips is called NB. Operational definition of NB is "putting one or more fingers in the mouth and biting on nail with teeth"²⁰.

Classification: Nail biting is not a pathological condition in all times and all clients. However, it is not exactly clear where the border between the healthy and unhealthy behaviour of NB is. Nail biting in healthy children is temporary, and does not last very long. The frequency, intensity and duration of pathological NB are higher than those in normal individuals. Uncertainties for the distinction of pathological and non-pathological NB are also reflected in the classification of psychiatric disorders. While some behavioural problems such as trichotilomania are classified as an impulse control disorder in Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), NB is not classified in DSM-IV^{1,21}. Nail biting can also be classified as a self-injurious behaviour such as pathological skin-picking or as a stereotypic movement disorder. Others believe that NB is a part of obsessive compulsive disorder spectrum.²²

Epidemiological factors: Nail biting usually does not start until the age of three or four years. There are contradictory reports about the prevalence of NB. The prevalence of NB increases from childhood to adolescence, and then decreases in adulthood². It is not clear what percentage of the children with NB behaviour stops it, and will not suffer from it later dysfunction. Moreover, patients with temporomandibular joint pain and dysfunction should be consulted as part of their management.²³

Etiological factors: There are a lot of controversies about the causes of NB. While some studies related NB to behavioural problems²⁴, and anxiety, others did not believe so²⁵. Anxiety in children with NB is not a trait; it is a state. The trait which is accompanied with NB is oral aggression²⁶. Oral habits including NB have an environmental etiology, and are risk factors for malocclusion development, especially in children older than preschool years. Inadequate motor activity is supposed to be a cause of an increase in NB¹.

The basic cause of onychophagia is difficult to determine. Although nail biters have more anxiety than those without the habit, no significant difference was found when relating onychophagia to anxiety² and it was also suggested that nail biting might reduce anxiety or tension; recent studies do not support the anxiety theory for nail biting. Others explain it as a family as a family trend, probably due to imitation.

Many people bite their nails in moments of stress. Children do it in moments of anguish, when they do not know a lesson, read sad stories, listen to horror stories, or are “forced” to go to bed at night.

In general, onychophagia is not a concern-raising habit and will spontaneously disappear when not stimulated. On the other hand, when associated with other problems, it becomes more complex, requiring specialized help.

By inference, onychophagia is transference of the thumb-sucking habit, because this tends to be abandoned during the third year of life, when onychophagia starts.

After adolescence, onychophagia is usually replaced by the habit of lip “pinching,” chewing of pencils or other objects, nose scratching, or hair twirling. In adults, smoking or gum chewing seems to be a more common substitute, because these are socially accepted methods of oral gratification. These can be considered good ways to transfer the onychophagia habit.

Complications: Nail biting children are at risk of developing malocclusion of the anterior teeth. Apical root resorption is a common and undesirable side effect of orthodontic treatment, particularly for the maxillary central incisors. Nonphysiological forces acting on the teeth, such as those from nailbiting, can speed up resorption or cause apical root resorption because, during treatment, the teeth are ligated to the archwire, and forces from biting can be transmitted through the wire to the neighbouring teeth, exerting unfavourable pressure on the periodontium, even without orthodontic treatment.

Clinical examinations of these patients can show crowding, rotation, and attrition on the incisal edges of the mandibular incisors and protrusion of the maxillary incisors. These malocclusions are created by pressures from the onychophagia habit.

It is believed; however, that no specific malocclusion is associated with onychophagia, because references are vague and not backed up by clinical or statistically significant evidence that onychophagia leads to malocclusion.¹⁹ Thus, it should not be seen as the primary cause of occlusal maladjustments.

Also, forceful and continuous habit of nail biting causes alveolar destruction in the area of the involved teeth. Chronic nail biting can also produce small fractures at the edges of the incisors, and gingivitis might result from continued nail biting. Nevertheless, the lack of scientific evidence in the literature, as well as personal observation, indicates that ordinary nail biting has no serious effect on the dentition, even considering its duration, even considering its duration, frequency, and intensity⁷.

Secondary bacterial infection can occur from diseases of the nail such as onychomycosis and paronychia, and nailbiting might spread the infection to the mouth. Conversely, a nail biter with oral herpes can develop herpetic whitlow of the bitten finger. A favourable aspect of nail biting is that fingernail growth is not retarded. It increases nail growth by approximately 20%, perhaps because frequent manipulation of the nail stimulates the circulation to the germinal area in the nail root.

Management: Nail biting is a habit that cannot be managed without considering some related factors such as co-morbidities, precedent and consequences of the behaviour. Some studies did not recommend the treatment of children with mild NB².

Any treatment should be accompanied by educating the afflicted children as well as their parents, siblings and teachers. They should be taught about what to do and what not to do about it. For example, they should know that punishment, threat or laugh at the children with NB can increase this behaviour, because they try to catch others' attention by NB.

Sometimes, the parents feel guilty for their children NB habits. These feelings should be detected and managed. Siblings may feel shame for to their brothers' or sisters' NB behaviour. So, they need to be included and educated in the process of management as well. Coating nails with unpleasant materials or covering them is tried by many parents, but it is usually ineffective. Others should not blame children with NB habit and increase their disappointments, instead they should encourage them, and give them support and confidence.

The management and treatment of child with NB behaviour will not happen in a few sessions, it is a long process. All of such clinical findings indicate that the management of NB is much more complicated than just focusing on its stoppage. Treatment is not as easy as it seems. Because NB can damage teeth and alveolar structure, the afflicted children should be referred for the assessment and management of possible damages.

There are some methods suggested for controlling of NB such as chewing gum or wearing a rubber piece on the wrist¹⁴. However, these approaches need to be studied in control trials for their efficacy. Also, the efficacy of engaging fingers with substitute activities such as writing, drawing, holding small balls, or musical instrument² should be investigated.

MATERIAL AND METHOD

Source of Data:

For data selection government and private schools in and around the city were selected. Children in the schools

were screened and included into the study. Only the schools whose principal/head of the school permitted the students to take part in the study were included

Inclusion Criteria:

- Subjects with and without chronic fingernail biting habit were chosen for the study.
- Subjects with age ranging between 10-16 years were included.

Exclusion Criteria:

- Subjects who had used antibiotics and antiseptic mouthwashes within the last 3 months were not included in this study.

Sample Size and Design:

The present study group consisted of 80 subjects and was divided into two groups:

Group I: Subjects with chronic fingernail biting habit.

Group II: Subjects without chronic fingernail biting habit.

In group I there were 20 male and 20 female subjects and in group II also 20 male and 20 female subjects were there.

Materials:

Reagents used:

- Potassium dihydrogen orthophosphate
- Potassium chloride
- Disodium hydrogen phosphate anhydrous purified
- Sodium chloride
- Phosphate buffered saline
- MacConkey agar (MA)
- Agar powder bacteriological
- Sheep blood
- Blood agar (BA)
- BHI broth
- Distilled water
- Normal saline
- Catalase (H₂O₂)
- Gram staining kit
- API 20E biochemical tests system

Armamentarium:

- Sterilized containers
- Centrifugation tubes
- Centrifuge
- Petridishes
- Weighing machine
- Micropipettes
- Laminar floor
- Incubator
- Oxidase disc
- Sterilized swabs
- Colony counter
- Test tubes
- Glass slides
- Glass marker
- Wire loop

- pH Strips
- Flask
- Olympus Binocular Microscope
- Autoclave

METHODOLOGY

The study was a comparative cross-sectional microbiological study, conducted on the saliva samples of 40 chronic nail-biting subjects in that 20 were males and 20 were females and 40 subjects without chronic nail-biting having male and 20 female subjects with age ranging from 10-16 years. Government and private schools in and around the city were selected. Children in the schools were screened and included into the study. Ethical requirements were met; the procedure was explained to the patients and detailed verbal case history and their written consent was obtained. Only the schools whose principal/head of the school permitted the students to take part in the study were included. Subjects who were uncooperative and/or apprehensive, who had other oral habits, who had recently suffered or were suffering from any medical illness, and who were presently on antibiotic therapy or using antiseptic mouthwash/rinse were excluded. Whole saliva samples were collected after recording the patient's details and oral findings.

The subjects were instructed to rinse their mouth with 10 ml of phosphate-buffered saline solution for 60 seconds. The subjects were asked to expectorate the rinse back into a universal container. Later the samples were concentrated by centrifugation at 17000 g (12500 rpm) for 10 minutes²⁷. The supernatant was discarded and the deposit was re-suspended in 1ml of phosphate-buffered saline to obtain a concentrated rinse. The procedures followed were in accordance with the ethical standards on human experimentation.

Then the sample was inoculated onto MacConkey's agar and Blood agar using the spread plating method to assess coliform bacteria. The plates were then incubated at 37°C for 24 hours and the growth for enterobacteriaceae was observed, which appears as pink colored or red colored colonies

The Enterobacteriaceae that grew in MacConkey's agar were examined using gram stain for gram negative bacilli. Once identified, the colonies were further subjected to a series of biochemical reactions like oxidase, catalase and oxidation-fermentation tests and then the organisms were purified by subculture on Blood agar and identified using the commercially available API 20E method which is the standard identification system for enterobacteriaceae and other gram negative rods. The laboratory procedures were carried out in RNT Medical College Animal Husbandry Department, Microbiological Laboratory.

STATISTICAL ANALYSIS:

The data was statistically analyzed using the SPSS statistical software. Two-tailed chi-square test was used to assess the difference in presence of enterobacteriaceae in nail biters and non-nail biters. Two-tailed student's t-test was used to assess the higher prevalence of

enterobacteriaceae between males and females. p values, less than 0.05 were considered significant.

RESULT

The present study included 80 subjects, 40 subjects with chronic nail biting (20 males and 20 females) and 40 with no oral habit (20 males and 20 females). The age selected for present study was 10-16 years. All the subjects were analysed for the presence of enterobacteriaceae and the difference was compared between the two groups. Out of 40 chronic nail biters, 34 (85%) subjects showed positive growth and 6 (15%) subjects showed negative growth for enterobacteriaceae. Out of 40 non-nail biter subjects 10 (25%) showed positive growth and 30 (75%) subjects showed negative growth for enterobacteriaceae. The growth of enterobacteriaceae was statistically significant in nail biters as compared to controls (p<0.0001) (Table 1) (Graph 1).

In the present study, the species of Enterobacteriaceae most commonly isolated was *Escherichia coli*, 23 out of

34(57.5%) nail biter subjects showed presence of *Escherichia coli*. *Enterobacter* and *Klebsiella*, were also isolated in 9(22.5%) and 2(5%) nail biter subjects, respectively. In non-nail biter subjects *Enterobacter* species were isolated in 4(10%) and *Escherichia Coli* in 6(15%) subjects (Table 2).

Among 40 male and 40 female subjects the number of colony forming units and prevalence was compared to find out the higher prevalence of enterobacteriaceae species among males and females. The prevalence of enterobacteriaceae was seen in 30 out of 40 male subjects and 29 out of 30 male subjects which showed no significant difference (Table 3). The number of colony forming units was seen more among males than females. The mean for colony forming units among males and females was 122.43, 72.55 and standard deviation was 39.63, 40.51 which was statistically significant (t value-4.07) (p<0.01) (Table 4, Graph 2).

Table 1: Showing positive and negative results for presence of enterobacteriaceae

Positive and negative growth of enterobacteriaceae	Chronic nail biters	Percentage	Non nail biters	Percentage	P value
Positive	34	85%	10	25%	P<0.0001
Negative	6	15%	30	75%	

Table 2: Showing presence of different enterobacteriaceae species in the two groups.

Species present	Chronic nail biting	Control group	Enterobacteria species % of nail biters	Enterobacteria species % of non-nail biters
<i>E. coli</i>	23	4	57.5%	10%
<i>Enterobacter</i>	9	6	22.5%	15%
<i>Klebsiella</i>	2	0	5%	0

Table 3: showing positive and negative growth of enterobacteriaceae among males and females.

Presence of enterobacteriaceae	Males	Females	Total
Positive	23	21	44
Negative	17	19	36
Total	40	40	80

Graph 1 showing positive and negative growth of enterobacteriaceae in chronic nail biters and non-nail biters

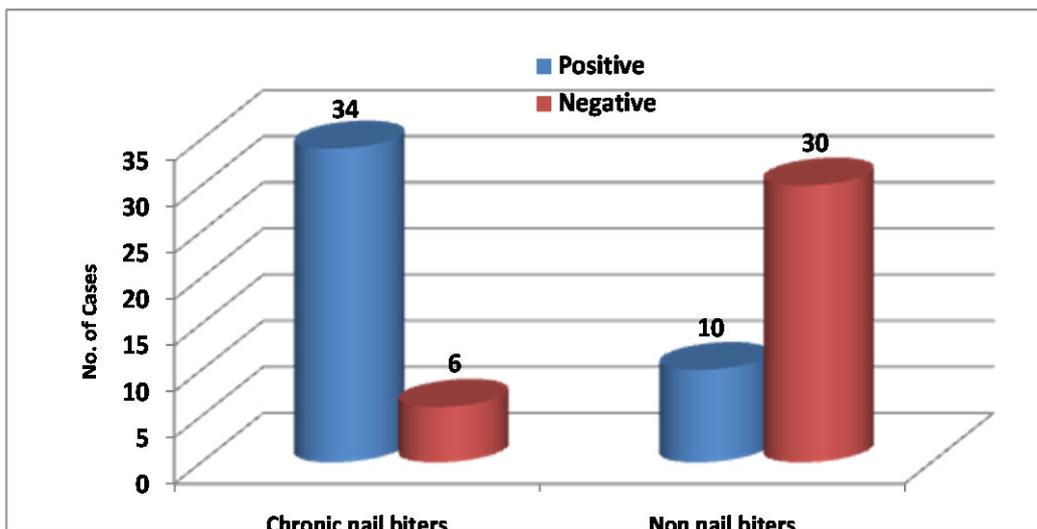


Table 4: Showing mean and standard deviation of colony forming units of enterobacteriaceae among males and females.

	Males (n=23)	Females (n=20)
Mean	122.43	72.55
SD	39.63	40.51
T value	4.07	
P Value	<0.01	

Graph 2 Showing mean of colony forming units of enterobacteriaceae among males and female



DISCUSSION

Natural oral microflora established during childhood changes throughout the stages of life under the influence of various environmental and behavioral factors. The naturally acquired microflora is essential for the normal development of the host physiology, and contributes to the host defenses by excluding exogenous microorganisms.²⁸

The oral microflora is highly diverse, and more than 500 species of bacteria have been isolated from the oral cavity. Competition and antagonism mechanisms among resident oral bacteria may help to maintain the ecological balance by preventing the overgrowth of some resident bacterial species. There is a direct and dynamic relationship between environment and microflora, even at the microhabitat level. If the profile of any microbial community is altered, pathogenic activity may be exhibited.^{9,29} The balance of the oral microflora can shift due to changes in the diet, dentition, reduction in saliva flow, or parafunctional habits.

Chronic nail biting can result in autoinoculation of pathogens and transmission of infection to other parts of the body. Pinworms are commonly found in school age children. These children will have perianal irritation as a result of the infection. When children scratch to relieve the itching, Enterobacteriaceae, viruses and pinworm eggs lodge under their nails. The hand-to-mouth behavior in children who are fingernail biters with inadequate or poor hand hygiene will result in spread of these microbes to oral cavity. Hence, microbial infections may be attributed to fecal oral route of transmission⁶.

Members of enterobacteriaceae are gram negative straight rods, aerobic and facultative anaerobic, oxidase negative and catalase positive organisms, mainly distributed in

soil, water, plants, animals and intestinal canal of humans⁷.

These Enterobacteria which are considered as pathogenic are transient organisms of oral cavity and can gain entry through oral pernicious habits or due to poor hygiene maintenance but do not cause any disease or any alteration of the oral microbial flora as such. The most notable species of Enterobacteria considered as pathogenic are *E.clocae*, *E.aerogenes* and *E.agglomerans*. These are the most common pathogens associated with hospital infections, representing 6% of all the nosocomial isolates and 10% of all pneumonia isolates.³⁰

Reports suggest that hospitalisation may create conditions that favor the oral and oropharyngeal colonization of anaerobic gram negative-rods.³⁰

The aim of the present study was to find out the prevalence of enterobacteriaceae in chronic nail biter and non-nail subjects and to find out the higher prevalence of the bacteria among males and females.

Prevalence of enterobacteriaceae among chronic nail biter and non-nail biter subjects:

In the present study the presence of enterobacteriaceae was significantly higher in nail biter subjects than non-nail biter subjects. Similar results were observed by Baydas B et al⁵ & Shushma R et al¹⁶. As members of enterobacteriaceae are found intestinal canal of humans, and for children with inadequate and poor toilet hygiene, enteric bacteria can pose a potential threat and danger by penetrating the body via mouth as a result of nail biting; so they can lead to various infections there.

In the present study the age chosen for the subjects was from 10-16 years as in several studies like, Shetty and Munshi (1998)³¹ in their epidemiological study on 4,590

school children found that prevalence of nail biting (12.7%) was more common in 13-16 year's age group. Leung and Robson (1990)³², in their review on nail biting habit found that 45% of adolescents were nail-biters, whereas only 28- 33% of children between the ages of 7 and 10 years were nail biters.

In the our study it was found that the nail biting habit was more among boys than girls which goes in accordance with N Shahraki et al¹⁵ who stated that nail biting habit is found more in boys than girls but the results are contrary to Ahmad Ghanizadeh et al³³ who found that nail biting habit was more among girls although the difference between boys and girls was not significant.

Presence of different enterobacteriaceae species among nailbiters and non-nail biters

In the present study, among the members of enterobacteriaceae, E. coli was most commonly found among the nail biter subjects. Enterobacter spp and kliebsella was also found among few subjects. Similar results were obtained in Baydas B et al³ & Shushma R et al⁴ except kliebsella specie which was not found in the previous studies.

Prevalence of enterobacteriaceae among males and females.

The prevalence of enterobacteriaceae was found in 57.5% males and 52.5% females which do not show any significant difference these findings are consistent with the results of Shumsha Reddy et al⁴ who found 69.7% of the male subjects and 60.7% of the female subjects with chronic nail biting habit.

Higher prevalence of enterobacteriaceae among males and females.

The number of colony forming units were more among males than females but the result was statistically significant. No previous study has been carried out regarding this context for comparison. Further studies should be carried out to find out the higher prevalence of enterobacteriaceae among males and females.

Thus the findings regarding nail biting and without nail bting of the present study and that of Baydaş et al³., and S Reddy et al⁴ indicate that there is definitely a higher prevalence of Enterobacteriaceae among nail- biting individuals than the individuals without any habit.

This higher prevalence of Enterobacteriaceae among subjects with nail- biting could be due to orofecal route of transmission of Enterobacteriaceae and poor general hygiene maintenance.

It is important to recognize and eliminate nail biting habit with a proper counseling and appropriate treatment. Individuals with chronic nail- biting habit should be given proper hygiene instructions to prevent contamination.

Dental specialists should take into consideration the increase in prevalence of Enterobacteriaceae in patients with nail biting and whenever required, should seek consultation with the patient's medical specialist, because any surgical intervention in an individual having these

habits are prone for the further systemic complications which could prove to be of medical significance. Individuals with chronic nail- biting habits should be given proper hygiene instructions to prevent contamination, and proper counseling towards the elimination of nail- biting habit.

SUMMARY AND CONCLUSION

The present study included 80 subjects of age ranging from 10-16 years. 40 subjects with chronic nail biting habit and 40 without nail biting habit were included. Each group consisted of 20 male and 20 female individuals. This was done to find out the higher prevalence of bacteria among males and females.

From the present study following conclusions were made regarding the enterobacteriaceae prevalence:

- 1) Chronic nail biting habit was more in males than females.
- 2) There was higher prevalence of enterobacteriaceae in chronic nail biting subjects than non-nail biters.
- 3) E.coli was the most common enterobacteriaceae species found in chronic nail biting subjects.
- 4) The prevalence of enterobacteriaceae was higher in males than females and it was statistically significant.

Based on present findings we support that nail biting habit plays an important role in the oral carriage of enterobacteriaceae and the prevalence of enterobacteriaceae is higher among males than females.

It is important for dental specialist to recognize any paranormal oral habit before starting any surgical procedure as it may become the route for transmission of bacteria and may cause gingival and dental injuries. The patient should be counselled about the habit and should be motivated to leave the habit.

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