ECRONICON OPEN ACCESS

EC PAEDIATRICS
Review Article

Onychophagia: Clinical Implications and its Comorbidities

Nagendran Jayavel Pandiyan*

Professor, Department of Paediatric Dentistry, Best Dental Science College, Madurai, Tamil Nadu, India

***Corresponding Author:** Nagendran Jayavel Pandiyan, Professor, Department of Paediatric Dentistry, Best Dental Science College, Madurai, Tamil Nadu, India.

Received: February 22, 2021; **Published:** March 31, 2021

Abstract

Biting of nail is a common stress-relieving oral habit. It involves biting the nail, cuticle and soft tissues surrounding the nail. This behavioural problem has been reported both in children and young adults. Onychophagia cannot be considered as an isolated dermatological or cosmetic problem as there could be associated co-occurring psychological issues. Treatment of nail biting involves multidisciplinary care. Hence practicing dentists should have a comprehensive knowledge in understanding and recognition of these deleterious oral habits.

Keywords: *Oral Habits; Onychophagia; Nail Biting; Obsessive-Compulsive Disorder*

Introduction

Nail biting is one of common stress-relieving oral habits. It involves biting the nail, cuticle and soft tissues surrounding the nail. This behavioural problem has been reported both in children and young adults. Disturbance related to the oral stage of psychological development were noticed in nail biting child [1]. Onychophagia comes under Tic type of disorders.

"Tic" is defined as repetitive, recurrent, persistent behavioural trait that is difficult, to control voluntarily. When tics involve the nail unit, these are termed "nail tic" disorders. These disorders includes a) Onychophagia: Chronic nail biting b) Onychotillomania: Recurrent picking and manicuring of the finger and/or toenails leading to shortening and/or extraction of the nails, c) Onychotemnomania: Result of cutting the nails too short with secondary trauma to the nails, d) Onychoteiromania: When the patient rubs the fingernails until they virtually disappear, e) Onychodaknomania: When the patient bites on single nails to gai n a lustful pain, f) Perionychotillomania: Subjects pick and tears the periungual skin, g) Bidet nails: Triangular worn-down nails occur as a consequence of compulsive washing, commonly affecting second to fifth fingers of the dominant hand [2].

These disorders straddle the realms of various medical specialities like Medicine, Dermatology, Psychiatry and Dentistry. Harmful oral habits causes of unbalanced forces on the developing dentition. Thus, dentists should have a comprehensive knowledge in understanding, recognition and elimination of these poorly understood and misdiagnosed habits.

Definition

Nail biting is defined as "placing one or more fingers in the mouth and biting on nail with teeth" [5]. This habit is limited to fingernails, and do not have any preference for the finger.[6] Crossing of any digit from an individual's lips is called Nail biting [3,4].

Prevalence

Prevalence of this habit in different populations are inconsistent. This behaviour usually starts during childhood or early adulthood stage [6-8]. More than half of the school-age population bites their fingernails either frequently or at least occasionally [9]. Prevalence among children and adolescents ranges between 20% to 29% [10-12]. Children below 3 - 6 years rarely exhibit this behaviour [13,14], however Foster., *et al*. have showed a prevalence rate of 23% among this age groups [15]. This behaviour decreases by 18 years of age and at times it may persist into adulthood [13,16].

In a study by AK Munshi., *et al*. [13] correlation between the habits and malocclusion in children of Mangalore, showed 29.7% of the samples had oral habits, among which 9.8% had pencil biting and 12.7% showed nail biting habits. Recent estimates were 20% to 30% in general population [17], 37% among 3 to 21 years old [18] and 21.5% among male adults [19].

Classification

Nail biting is classified as other specified behavioural and emotional disorders (F98.8) by International Classification of Diseases and Health Related Problems - 10th Revision (ICD-10)) [20]. Nail biting is also categorised as obsessive compulsive disorder by Diagnostic and Statistical Manual of Mental Disorders produced by the American Psychiatric Association in its fifth edition [21].

Obsessive-compulsive tendencies may manifest dermatologically as onychotillomania, trichotillomania, skin picking, and acne excoriee [16,22]. currently these issues have been termed as body focused repetitive behaviours [23,24].

"Body-focused repetitive behaviour" disorders manifest as inability to perform certain behaviours that cause a degree of relief [25]. These behaviour cause physical and psychological problems [26]. These behaviours may also be referred as nervous habits [27]. Nail biting is also classified as a self-injurious behaviour or a stereotypic movement disorder [28].

Etiology and risk factors

Onychophagia may be due to result from stress, excitement, boredom or inactivity [23,24]. Individuals seem to experience pleasure during nail biting [24]. Higher concordance rates among monozygotic twins as compared with that of dizygotic twins (66% vs. 34%) suggests a genetic basis among nail bitters [32].

Few observations have suggested co-existence of nail biting and OCD/anxiety disorders [25,26]. Parents of children with nail bitters often suffered from psychiatric disorder like major depressive disorder and the incidence is about 56.8% in mothers and 45.9% in fathers [4]. The children born to mothers with schizophrenia or bipolar disorder showed more of this habit when compared to normal group [27].

Studies had shown that, 24.1% of patients suffered from this habit with temporomandibular joint pain dysfunction [28]. Bottle feeding for longer period of time, in addition with pacifier use, are also considered potential risk factors [29]. Soothing activities like thumb and pacifier sucking performed by an infant were considered the first coordinated muscular activities [30]. Suckling reflex which is often necessary for infants to feed, usually phase out by the age of 3 years. The onset of nail biting is considered to be a pathologic continuation [31].

Outcomes of the behaviour

Dental

Chronic compulsive nail biting patients are highly susceptibility to oral infection and trauma. Enterobacteriaceae is found to be more in the oral cavities of children with Onychophagia [33]. Poor oral hygiene, notched teeth along with inflamed gingiva are seen. Abnormal

force from biting nails had shown to cause apical root resorption [34], alveolar destruction [31], malocclusions [35], temporomandibular disorders [36] and gum injuries [37].

General

Nail shortening [38], orodigital transmission of papilloma, herpes viruses, development of contagious warts and vesicular lesions [39]. Decrease of individuals' self-esteem and negative socials/psychological disturbances for patients and their parents [40].

Comorbidities

Three common co-occurring psychiatric problems are attention deficit hyperactivity disorder (74.6%), separation anxiety disorder (20.6%) and oppositional defiant disorder (36%) [4]. Other co-morbid disorders include enuresis (15.6%), tic disorder (12.7%), obsessive compulsive disorder (11.1%), major depressive disorder (6.7%), mental retardation (9.5%) and pervasive developmental disorder (3.2%) [4].

Differential diagnosis

Differential diagnosis includes: Onychomycosis which is a fungal infection of the nailbed. Nail psoriasis exhibit as nail pitting, nail bed separation, discoloration, and splinter hemorrhages [41]. Lichen planus is an inflammatory muco-cutaneous disease that can be mistaken for onychophagia [42].

Management and treatment

Nail biting habit management should include other related factors such as co-morbidities, precedent and consequences of the behaviour. Some studies do not recommend any treatment for children with mild nail biting. Assessment of disease severity is needed before formal intervention, because of psychosocial involvement in disease process. Children with mild behaviour usually reduces the activity by seeing peers with good nail hygiene. Forcing younger children to get treated may increase the habit to obtain attention [31].

Psychotherapy

Behavioural or psychotherapeutic approaches, cognitive behavioural techniques were available as management with this habit. However, these techniques are based on learning principles where children are taught to control nail biting behaviours.

Habit reversal therapy (HRT)

Silber KP., *et al*. suggested that Onychophagia itself is a learned habit and not an emotional condition [43]. Habit reversal treatment uses same or dissimilar responses to improve oral-digital behaviour. The two approaches are equal in terms of improvement or acceptability. This therapy provides awareness to patients and alternative methods to cope [44]. HRT includes three components: Awareness training, competing response training (e.g. chewing gum) and a social support system [45].

Recording, videotaping the behaviour and describing its frequencies increases the awareness and help to monitor their own behavioural changes. Patients can be trained for deep breathing, muscle relaxation and visual imagination of self-relaxation. Behaviour that is incompatible with nail biting can be introduced. Children can visit new places or perform activities that has been omitted before. Parents of children with nail biting habit should be informed that behavioural changes are a long process and it takes time to see its effect [3].

Aversive therapy

It is part of a three-step behaviour changing technique [45]. First step involve removing environmental triggers such as splintered cuticles, followed by increasing the difficulty to perform (bandaging fingers) and finally removing positive reinforcements (adding aversive components to the nails).

Coating of distasteful substances over the nail has shown improvement in reducing impulsive nail-biting behaviour. However, this method is not ideal for patients with compulsive disorders [46]. Application of olive oil]47], quaternary ammonium compounds and 4% quinine suspended in petroleum [48] were also recommended.

Cognitive behavioural therapy

Limited studies describe the use of aversive hypnosis to reduce chronic nail biting [49]. It is based on both behaviour and cognitive model, works to limit maladaptive coping behaviours [50]. Combination of hypnotherapy with behavioural modification therapy to improve this habit and promote remission was proposed by Bornstein., *et al* [51].

Functional analysis therapy

This therapy helps to identify the specific environments, situations that may be source for the behaviour. It formulates targeted treatment aimed at behaviour reduction and eventual extinction [3].

Pharmacotherapy

Fluoxetine, selective serotonin reuptake inhibitor was effective for the treatment of chewing of digits [52]. Tri-cyclic antidepressant drug, clomipramine has been found to be very useful and was more effective than desipramine in a double-blind study [53]. Antioxidant and glutamate modulator N-acetylcysteine has also shown positive outcomes in the treatment of repetitive disorders including Onychophagia [54,55].

Punishment

Punishment is not effective in the treatment of onychophagia. Placebo has better effect than of punishment [23].

Dental appliance

Fixed appliance made of stainless steel round wire, twisted and bonded from lower canine to canine was used successfully [56].

Simple preventive strategies

Keeping the nails trimmed and filed is essential for good hygiene [38]. Applying cosmetics on nail act as treatment and as a method to mask severe nail dystrophy [57].

Creating a sticker chart and rewarding the child by adding a sticker each day will keep them motivated [58]. Older child can use chewing gum as an option in socially stressful situations. Activities such as arts and crafts, sports and musical instrument to distract and reduce distress [59].

Books and social media can provide support and strategies. Dr. Huebner [60], in his book discusses about on identifying bad habits, bring self-awareness and tips to reduce the habit. Bernstein Bears [61] addresses this habit in an episode on YouTube.

Conclusion

Nail biting is a less-recognized problem in daily clinical practice, occurring from mild to severe forms. Nail biting may not be an isolated condition. It can be from a cluster of symptoms along with psychological components which should be assessed, evaluated, and managed. Treatment of nail biting involves psychosocial, psychiatric, dermatologic and dental care. Both the patient and parents should be involved. Subsequently close acquaintances and teachers may be called upon to reinforce supportive behaviour modification. The home environment should be loving for the child with continuous words of encouragement. Appropriate preventive steps can help to prevent future dento-facial problems.

Bibliography

1. Pearson GHJ. "The psychology of finger sucking, tongue sucking, and other oral habits". *American Journal of Orthodontics* 34 (1948): 589-598.
2. Singal A and Daulatabad D. "Nail tic disorders: Manifestations, pathogenesis and management". *Indian Journal of Dermatology, Venereology and Leprology* 83 (2017): 19-26.
3. Dufrene BA., *et al*. "Functional analysis and treatment of nail biting". *Behavior Modification* 32 (2008): 913-927.
4. Ghanizadeh A. "Association of nail biting and psychiatric disorders in children and their parents in a psychiatrically referred sample of children". *Child and Adolescent Psychiatry and Mental Health* 2 (2008): 13.
5. Teng EJ., *et al*. "Body-focused repetitive behavior problems. Prevalence in a non-referred population and differences in perceived somatic activity". *Behavior Modification* 26 (2002): 340-360.
6. Leung AK and Robson WL. "Nail biting". *Clinical Pediatrics* 29 (1990): 690-692.
7. De Berker D. "Childhood nail diseases". *Dermatologic Clinics* 24 (2006): 355-363.
8. Apley J. "Child care in general practice. Emotional and behavioural disorders: part I". *British Medical Journal* 17 (1965): 157-159.
9. Gavish A., *et al*. "Oral habits and their association with signs and symptoms of temporomandibular disorders in adolescent girls". *Journal Citation Reports* 27 (2000): 22-32.
10. Feteih RM. "Signs and symptoms of temporomandibular disorders and oral parafunction in urban Saudi Arabian adolescents: a research report". *Head and Face Medicine* 2 (2006): 25.
11. Ghanizadeh A and Shekoohi H. "Prevalence of nail biting and its association with mental health in a community sample of children". *BMC Research Notes* 4 (2011): 16-20.
12. Christensen JR and Fields HW. "Oral habits". In: Pinkham JR, Casamassimo PS, McTigue DJ, Fields HW, Nowak A, editors. Pediatric dentistry: infancy through adolescence. Philadelphia, PA: WB Saunders Co (1994): 366-373.
13. Shetty SR and Munshi AK. "Oral habits in children – a prevalence study". *Journal of Indian Society of Pedodontics and Preventive Dentistry* 16 (1998): 61-66.
14. Ballinger BR. "The prevalence of nail-biting in normal and abnormal populations". *British Journal of Psychiatry* 117 (1970): 445-446.
15. Foster LG. "Nervous habits and stereotyped behaviors in preschool children". *Journal of the American Academy of Child and Adolescent Psychiatry* 37 (1998): 711-717.

16. Gregory LH. "Stereotypic movement disorder and disorder of infancy, childhood, or adolescence NOS". In: Kaplan HI, Sadock BJ, editors. Comprehensive textbook of psychiatry. 6th edition. Baltimore: Williams and Wilkins (1995): 2360-2362.

17. Pacan P., *et al*. "Onychophagia and onychotillomania: Prevalence, clinical picture and comorbidities". *Acta Dermato-Venereologica* 94.1 (2014): 67-71.

18. Winebrake JP., *et al*. "Pediatric onychophagia: A survey-based study of prevalence, etiologies, and co-morbidities". *American Journal of Clinical Dermatology* 19.6 (2018): 887-891.

19. Pennington LA. "The incidence of nail biting among adults". *The American Journal of Psychiatry* 102 (1945): 241-244.

20. World Health Organization. The ICD-10: classification of mental and behavioural disorders: clinical description and diagnostic guidelines. Geneva: WHO (1992).

21. American Psychiatric Association. "Diagnostic and statistical manual of mental disorders". 5th Edition. Arlington, VA: American Psychiatric Association (2013).

22. Koo JY and Smith LL. "Obsessive-compulsive disorders in the pediatric dermatology practice". *Pediatric Dermatology* 8 (1991): 107-113.

23. Williams TI., *et al*. "What is the function of nail biting: an analog assessment study". *Behaviour Research and Therapy* 45 (2006): 989-995.

24. Penzel F. "Skin picking and nail biting: related habits". *Articles by Western Suffolk Psychological Service* (2008).

25. Grant JE., *et al*. "Impulse control disorders in children and adolescents with obsessive compulsive disorder". *Psychiatry Research* 30 (2010): 109-113.

26. Nestadt G., *et al*. "The identification of OCD-related subgroups based on comorbidity". *Biological Psychiatry* 53 (2003): 914-920.

27. Vafaei B and Seidy A. "A comparative study on the prevalence of emotional and behavioral symptoms in children and adolescents born to mothers with schizopherenia and other psychotic disorders". *Acta Medica Iranica* 41 (2003): 254-259.

28. Saheeb BDO. "Prevalence of oral and parafunctional habits in Nigerian patients suffering temporomandibular joint pain and dysfunction". *Journal of Medicine and Biomedical Research* 4 (2005): 59-64.

29. Sabuncuoglu O., *et al*. "Breastfeeding and parafunctional oral habits in children with and without attention-deficit/hyperactivity disorder". *Breastfeeding Medicine* 9.5 (2014): 244-250.

30. Turgeon-O'Brien H., *et al*. "Nutritive and non-nutritive sucking habits: A review". *Journal of Dentistry for Children - AAPD* 63.5 (1996): 321-327.

31. Tanaka OM., *et al*. "Nail biting, or onychophagia: A special habit". *American Journal of Orthodontics and Dentofacial Orthopedics* 134.2 (2008): 305-358.

32. Bakwin H. "Nail-biting in twins". *Developmental Medicine and Child Neurology* 13 (1971): 304-307.

33. Baydas B., *et al*. "Effect of a chronic nail-biting habit on the oral carriage of Enterobacteriaceae". *Oral Microbiology and Immunology* 22 (2007): 1-4.

34. Odenrick L and Brattström V. "The effect of nail biting on root resorption during orthodontic treatment". *The European Journal of Orthodontics* 5 (1983): 185-188.

35. Oliveira AC., *et al*. "Factors associated with malocclusions in children and adolescents with Down syndrome". *American Journal of Orthodontics and Dentofacial Orthopedics* 133 (2008): 489.

36. Winocur E., *et al*. "Oral habits and their association with signs and symptoms of temporomandibular disorders in adolescents: a gender comparison". *Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology* 102 (2006): 482-487.

37. Krejci CB. "Self-inflicted gingival injury due to habitual fingernail biting". *Journal of Periodontology* 71 (2000): 1029-1031.

38. Lee DY. "Chronic nail biting and irreversible shortening of the fingernails". *The Journal of the European Academy of Dermatology and Venereology* 23.2 (2009): 185.

39. Szinnai G., *et al*. "Multiple herpetic whitlow lesions in a 4-year-old girl: Case report and review of the literature". *European Journal of Pediatrics* 160.9 (2001): 528-533.

40. Joubert CE. "Relationship of self-esteem, manifest anxiety, and obsessive compulsiveness to personal habits". *Psychological Reports* 73 (1993): 579-583.

41. Jiaravuthisan MM., *et al*. "Psoriasis of the nail: Anatomy, pathology, clinical presentation, and a review of the literature on therapy". *Journal of the American Academy of Dermatology* 57.1 (2007): 1-27.

42. Goettmann S., *et al*. "Nail lichen planus: Epidemiological, clinical, pathological, therapeutic and prognosis study of 67 cases". *The Journal of the European Academy of Dermatology and Venereology* 26.10 (2012): 1304-1309.

43. Silber KP and Haynes CE. "Treating nail biting: a comparative analysis of mild aversion and competing response therapies". *Behaviour Research and Therapy* 30 (1992): 15-12.

44. Woods DW., *et al*. "Comparing the effectiveness of similar and dissimilar competing responses in evaluating the habit reversal treatment for oral-digital habits in children". *Journal of Behavior Therapy and Experimental Psychiatry* 30 (1999): 289-300.

45. Magid M., *et al*. "Onychophagia and onychotillomania can be effectively managed". *Journal of the American Academy of Dermatology* 77.5 (2017): e143-144.

46. Koritzky G and Yechiam E. "On the value of non-removable reminders for behavior modification: An application to nail-biting (onychophagia)". *Behavior Modification* 35.6 (2011): 511-530.

47. Isaacs S. "Bad habits". *The International Journal of Psychiatry in Medicine* 1935.16 (1935): 440-454.

48. Tosti A and Piraccini BM. "Treatment of common nail disorders". *Dermatologic Clinics* 18.2 (2000): 339-348.

49. Leshan L. "The breaking of a habit by suggestion during sleep". *Journal of Abnormal Psychology* 37 (1942): 406-408.

50. Rothbaum BO., *et al*. "Cognitive-behavioral therapy". In: Foa EB, Keane TM, Friedman MJ, editors. Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies. New York, NY: Guilford Press (2000): 320-325.

51. Bornstein PH., *et al*. "Hypnobehavioral treatment of chronic nail biting: A multiple baseline analysis". *International Journal of Clinical and Experimental Hypnosis* 28.3 (1980): 208-217.

52. Velazquez L., *et al*. "Fluoxetine in the treatment of selfmutilating behavior". *Journal of the American Academy of Child and Adolescent Psychiatry* 39 (2000): 812-814.

53. Leonard HL., *et al*. "A double-blind comparison of clomipramine and desipramine treatment of severe onychophagia (nail biting)". *Archives of General Psychiatry* 48 (1991): 821-827.

54. Ghanizadeh A., *et al*. "N-acetylcysteine versus placebo for treating nail biting, a double blind randomized placebo controlled clinical trial". *Anti-Inflammatory and Anti-Allergy Agents in Medicinal Chemistry* 12.3 (2013): 223-228.

55. Sani G., *et al*. "Drug treatment of trichotillomania (hair-pulling disorder), excoriation (skin-picking) disorder, and nail-biting (onychophagia)". *Current Neuropharmacology* 17.8 (2019): 775-786.

56. O Marouane., *et al*. "New Approach to Managing Onychophagia". *Case Reports in Dentistry* (2016).

57. Lorizzo M., *et al*. "Nail cosmetics in nail disorders". *Journal of Cosmetic Dermatology* 6.1 (2007): 53-58.

58. Ortiz L and Garzon CR. "Modification of urinating behavior of enuretic preadolescents using a token economy". *Aprendizaje y Comportamiento* 1.1 (1978): 75-86.

59. Massler M and Malone AJ. "Nail biting; a review". *American Journal of Orthodontics* 36.5 (1950): 351-367.

60. Huebner D. "What to do when bad habits take hold: A kid's guide to overcoming nail biting and more American Psychology Association. Washington, DC: Magination Press (2008).

61. The Berenstain Bears Official Updated reference: The Berenstain Bears Official (2014).

Volume 10 Issue 4 April 2021