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DIFFERENCES BETWEEN MALE AND FEMALE DENTAL ARCH FORM

Study in Banjarnese Students of Dentistry Program
 Medical Faculty of Lambung Mangkurat University
 (Research Report)

Rosihan Adhani, Widodo, Adib Muntasir

Dentistry Study Program Medical Faculty of Lambung Mangkurat University, Banjarmasin

ABSTRACT

Background: Acrylic resin as denture base material has been mostly used. Cleanliness of denture base can be maintained by submerging the denture base into 0,2% chlorhexidine gluconate. Uncleaned denture base can cause Denture Stomatitis. There are the flora accumulation like *Candida albicans*. Small white ginger has activity towards *Candida albicans*. Small white ginger has antifungal role because of its phenol compound. **Purpose:** This study aims to know the Minimum Inhibitory Concentration value (MIC) of ethanol extract concentration of small white ginger towards *Candida albicans* growth in submerge of heat cured removable acrylic denture. **Method:** This experimental study was using post test only with control group design. Acrylic resin was submerged into 30%, 35%, 40%, 45%, 50%, 60%, 70%, 80%, 90%, 100% treatment extract, and as the control group, there are 0,2% chlorhexidine gluconate and 70% ethanol. The data analyzed used One Way Anova test and Bonferroni Post Hoc test with 95% confidence level. **Result:** The result of the study shows that MIC value of 40%, 45%, 50%, 60%, 70%, 80%, 90% and 100% from treatment extract consecutively are 13.07%; 18.36%; 23.67%; 28.87%; 36.84%; 42.10%; 49.98%; 52.61%. **Conclusion:** The conclusion of this study is treatment extract can reduce the amount of *Candida albicans* and 100% treatment extract has better antifungal effect compared to lesser concentrations and 0,2% chlorhexidine gluconate.

Keywords: dental arch form, mandibular, gender, Banjarnese

Correspondence : Rosihan Adhani, Dentistry Program, Medical Faculty Lambung Mangkurat University, Jl. Veteran 128B, Banjarmasin 70249, South Kalimantan, e-mail:rosihan_adhani@yahoo.co.id

INTRODUCTION

The prevalence of malocclusion in Indonesia reaches up to 80% and is placed third after caries and periodontal disease. In South Kalimantan, residents over 12 years old who have abnormal dental function amount to 16,6%.^{1,2} Those massive numbers followed by people's growing knowledge of malocclusion problems alongside the improvement of people's standard of living become the primary cause of increasing orthodontic treatment demands. Drg. Evie Lantiur in her research stated that 48,5% of her respondents demanded orthodontic treatments.³

The success of orthodontic treatment depends on diagnosis and appropriate treatment plan. Mandibular dental arch form is a prominent thing influencing diagnosis and treatment plan.^{4,5}

According to a number of researchers, mandibular dental arch form is one of the stability factors in orthodontic treatment outcomes. Raberin stated that one of the main principles in determining dentofacial orthopaedic diagnosis and treatment plan is dental alignment in mandibula, because mandibular dental arch is an important factor in maintaining stability of orthodontic treatment outcomes.⁶

Orthodontists have established an ideal dental arch as the result of orthodontic treatment. But Monique Raberin (1993) in her research stated that there couldn't be only one form of ideal dental arch because ideal dental arch is different from person to person. Dental arch form in transverse and sagittal direction in one person is different to another, this is affected by a number of factors, such as

environmental, nutritional, genetic, racial, and gender. Dental arch is based on bone form, and after the eruption of teeth, dental arch adapts to them and the influence of oral cavity muscle tissues. Different genetic setups and environments affect the development of dental arch. Maternal genetic substances mostly inherited by daughters instead of sons which makes mild significance in dental arch differences.^{7,8}

Mandible is a part of the face which bone structures are most sturdy compared to other facial bones and very individual. Each person has different growth pattern, thus there's no two persons who have the exact same size and shape of dental arch. This leads to the need to a normal value of mandibular and maxillary dental arch forms in each race group.⁹

Indonesia is not a homogeneous country, it has diverse count of cultures, compiled from numbers of geographical areas and environments.¹⁰ Sassouni and Ricketts suggested that different racial groups will present different craniofacial patterns too.¹¹ According to Raberin (1993) there are five forms of ideal mandibular dental arch in Caucasian race: narrow, wide, mid, pointed, and flat. A number of researches have been carried out to examine the sizes and forms of mandibular dental arch in Proto and Deutro-Malay ethnic group of Indonesia people, some of those are by Febrina et al (1997) on 200 students of Dentistry faculty Padjajaran University which presented 54,55% of pointed mandibular dental arch forms, then by Gunawan (2002) on Javanese and Papua people which showed Javanese people's mandibular dental arch varied among the five types of narrow, wide, mid, pointed, and flat meanwhile in Papua people the dental arch forms were mostly revealed as pointed, thus it can be concluded that each ethnic group in Indonesia has different size and form of mandibular dental arch, and that result doesn't leave out Banjarnese people.¹²

Because of the fact that there are varied forms of mandibular dental arch form, there is no single archwire that can be used in all orthodontic cases. In other words, an orthodontic clinician or practitioner has to use formed and adapted archwire to individual dental arch. This research needs to be carried out because there's variety in mandibular dental arch forms in each ethnic group of Indonesia, including Banjarnese people. This thing is based on the fact that most South Kalimantan's citizens are Banjarnese people.

MATERIALS AND METHODS

This was a descriptive analytic study using cross sectional approach. Materials used were alginate impression material, dental stone, water, and mandibular study models. Tools used were digital caliper, mechanic pencil, metal ruler, impression trays, rubber bowl, spatel, diagnostic

tools, data sheets, handsoons, masks, and questionnaires. The population in this study was Banjarnese students of Dentistry program Medical Faculty of Lambung Mangkurat university registered in year 2010 to 2013. Samples were chosen using purposive sampling and up to 60 samples were recorded, consisted of 30 males and 30 females with inclusion criteria of: filling in informed consent as participant, Banjarnese students of Dentistry program Medical Faculty of Lambung Mangkurat University, complete counts of teeth from mandibular tooth number 37 to 47, aged ≥ 18 years old, no restorative treatment and caries on inter-proximal surfaces of mandibular teeth.

Variable studied was caries index between mild and severe malocclusion from teenagers attending Ponpes Darul Hijrah Martapura. Samples from population were chosen randomly. Malocclusion was examined through observation, and then maxillary and mandibular impressions were taken and casted as models using type III stone. To determine the degree of malocclusion, mild or severe, samples' models were measured using HMAR index and DMF-T was used to determine caries index in samples. Examination results were recorded on estimation sheets and data collecting was done. Data analysis was completed using descriptive analytic method.

RESULTS

The result of research "Differences Between Male And Female Dental Arch Form in Banjarnese Students of Dentistry Program Year 2010-2014" can be seen in Table 1.

Table 1. Differences Between Male And Female Dental Arch Form in Banjarnese Students of Dentistry Program Year 2010-2014

Dental arch form	Gender					
	L	%	P	%	Total	%
Narrow	3	10%	7	23,33%	10	16,67%
Wide	5	16,67%	2	6,67%	7	11,67%
Flat	13	43,33%	5	16,67%	18	30%
Mid	5	16,67%	3	10%	8	13,33%
Pointed	4	13,33%	13	43,33%	17	28,33%
Total	30	100%	30	100%	60	100%

From table 1, we can see the percentages of each form of mandibular dental arch in Banjarnese students of dentistry program Lambung Mangkurat

University year 2010-2014: 10 people (16,67%) have narrow form, 7 people (11,67%) have wide form, 8 people (13,33%) have mid form, 17 people (28,33%) have pointed form, and 18 people (30%) have flat form.

The most common mandibular dental arch form in male students is flat, found in 13 people (43,33%) and the least is narrow, found in 3 people (10%), meanwhile in female students, the most common is pointed, found in 13 people (43,33%) and the least is wide, found in 2 people (6,67%).

DISCUSSION

Study on dental arch morphology is an important part of medicine, especially in dentistry. Dental arch form becomes the main consideration for dentists, and the main tool in predicting future growth pattern and treatment outcomes' stability. Dental arch evaluation is notable in making definitive diagnosis and optimal craniofacial treatment; while keeping in mind that a fine esthetic will occur when there's harmonization between dental arch and teeth size morphology.^{13,14,15}

The results of this research revealed that the most common dental arch form in Banjarnese female students is pointed, which concurred to the result of previous study by Liang who examined the mandibular dental arch form in Malaysian Malay students. According to Liang, in Indonesian people, bimaxillary protrusion was frequently found thus pointed dental arch form was more common. Liang also stated that from the aspect of dental arch form, there is a difference between males and females. Males' dental arch is wider compared to females.⁸

Moyers and Cassidy suggested factors affecting the development of dental arch, such as genetic and environmental: location, food, oral habits, malnutrition, physical, and diseases. Change in daily diet, such as softer food texture causes the lessening functional use of masticatory muscles and teeth. Because of this, there will be changes in facial developments too, and a narrower maxilla.^{16,17} According to Munakhir, one of the factors affecting growth and development of mandible is malnutrition and food consistency. Malnutrition can cause slower mandibular growth and food consistency can gradually affect maxillary and mandibular arch sizes.¹²

Moyers suggested that arch width in males is wider than that in females. This is caused by the bigger faces of males and vast growth in transverse direction compared to females. Dental arch in sagittal direction in males are bigger than females, because of the equally wider mesiodistal width of teeth, thus making their jaws longer.¹⁶ This result concurred to Budiraharjo and Pradopo (2002) and Desy FK et al (2007)'s researches, which stated that males' teeth are wider than females. Factors affecting the difference are among functional strength, masticatory habits, and trauma.¹⁹

Lavelle stated that the sizes difference of mandibular dental arch between males and females is caused by a number of factors such as, functional strength, masticatory habits, physical traits, and trauma which usually affect males.¹⁸ This result is supporting the researches of Forster CM et al (2008), Agnihotri G. and Gulati M. (2008), dan Kiliaridis et al (2003). According to Forster CM et al (2008) and Kiliaridis et al (2003), dental arch width can be affected by masticatory muscles during craniofacial growth. Individuals with thick masseter muscles tend to have wider transversal size. Agnihotri G. and Gulati M. (2008) said that the difference of dental arch width between males and females is affected by cultures, environments, racial, and facial types.^{19,20}

Based on the result of this research, it can be concluded that there is a difference of mandibular dental arch form in male and female Banjarnese students of Dentistry program Lambung Mangkurat University.

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