

# Prevalence of Hypertension in Completely Edentulous Patients

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## Abstract

Edentulism is the state of having lost all of one natural teeth. Cardiovascular disease is one of the leading causes of premature death among Non communicable disease. Hypertension increases the risk of Cardiovascular events. Tooth loss is defined as separation of tooth from its supporting structure and this can be caused by tooth caries , failure of endodontic treatment, periodontal disease, fractured tooth. The aim of the study is to investigate the prevalence of hypertension in completely edentulous patients. This retrospective study was conducted among patients aged 25-85 years reporting to Saveetha Dental college and hospitals . For data collection, we reviewed patients records and analysed the data of 86,000 patients between June 2019 and March 2020. Collected data are entered in the excel sheet. Data analysis and results done through SPSS. Prevalence of completely edentulous patients is more common among 56-65 years of age . Male are more commonly affected. Prevalence of hypertension is more in males compared to females. Within the limits of the study , prevalence of completely edentulous patients is more common in 56-65 years of age and males are more common compared to females.

**Keywords:** *Completely edentulous , Hypertension, Male, prevalence, age.*

## Introduction

Edentulism is the state of having lost all of one's natural teeth . <sup>1</sup> Monitoring the occurrence of an oral end state such as edentulism is important because it is an indicator of both population health , the functioning and adequacy of a country's oral health care system . <sup>2</sup> Tooth loss is defined as separation of tooth from its supporting structure and this can be caused by tooth caries , failure of endodontic treatment, periodontal disease, fractured tooth.<sup>3</sup>

Hypertension is defined as an abnormal elevation of systolic and diastolic pressure above normal range.<sup>4</sup> The

normal range of systolic and diastolic pressure will be 100 - 140 mmHg and 60 - 100 mmHg respectively. <sup>5</sup> It can affect the physical and social lifestyle of a patient that may have a role in increased risk of hypertension.<sup>6</sup> Complete edentulism has been shown to be associated with the development of hypertension. The comfort, function, and esthetics must be restored altogether while treating a completely edentulous patient. One of the main objectives in selecting and arranging artificial teeth is to produce a prosthesis that defies detection.<sup>7,8</sup>

A previous study showed that the means of blood pressure were higher in patients with complete denture. <sup>9</sup> Tooth loss has been reported to be associated with an increase in cardiovascular diseases.<sup>10</sup> Hypertension increases the risk of cardiovascular events , well known risk factors for hypertension like lack of physical activity, obesity etc . Apart from complete denture other options are available for replacing missing natural teeth such as fixed prosthesis, implant retained over dentures <sup>11</sup>, RPDs , still play a major role in prosthetics rehabilitation owing to financial issues, patients compliance and residual height of edentulous ridges.<sup>12, 13</sup> Some authors showed

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that the prevalence of hypertension in Malaysia was 66.8 .<sup>14</sup> The prevalence of edentulism in the United States is around 30-35% among older adults and while Malaysia is around 30-40%<sup>1516</sup>.

In addition to well known risk factors for hypertension, obesity, lack of physical activity, smoking, low income, education level and several studies have shown an independent association between tooth loss and blood pressure.<sup>17</sup> However the relevant literature is not conclusive about the association. Tooth loss and periodontal diseases are considered to be the markers of oral health and however complete tooth loss is a total failure of oral health.<sup>18,19</sup> Volzke et al., study showed an inverse association between hypertension and complete edentulous patients among men but not in women.<sup>20,21</sup> Aloe Vera has its uses in various systemic diseases like diabetes, hyperlipidemic patients etc. It has beneficial effects to prevent microbial infections such as caries etc., because caries, periodontal diseases are one of the causes of tooth loss.<sup>2223</sup>

Compromised oral hygiene resulting in the accumulation of plaque and calculus induces inflammatory changes in the adjoining areas which leads to subsequent pathogenic microbial colonization.<sup>24</sup> The bacteria most commonly affect tooth loss is streptococci.<sup>25</sup> A multidisciplinary population based study reported that prevalence of systolic blood pressure is high in Brazilian population. A study in the South African population reported that complete edentulous is a risk indicator for hypertension.<sup>26</sup> Establishing a healthy oral environment and maintaining proper oral hygiene are the primary objectives.<sup>27</sup> Increased life expectancy and increase in population, creates high demand in dental care especially in the field of prosthodontics.<sup>28</sup> Furthermore, there is a need for further studies on diverse populations to strengthen the prevalence of hypertension in completely edentulous patients. Hence the aim of our study is to investigate the prevalence of hypertension in completely edentulous patients.

## Materials and Method

A retrospective study was conducted among patients aged 25-85 years reporting to Private dental institutions, Chennai. Ethical approval was obtained from the Institutional Scientific Review board. Number of people involved in this study were two researchers

and one guide.

## Sample methods :

Non probability screening of the specified population, All case sheets reviewed from June 2019 to March 2020. The inclusion criteria will be completely edentulous patients and hypertension. Internal validity will be non probability inclusion and external validity will be homogenisation, replication and cross comparison.

## Data collection :

For data collection, we reviewed patients records and analysed the data of 86,000 patients between June 2019 and March 2020. We recorded all the patient details and systemic diseases like hypertension and tabulated. The sample size considered was 915. Tabulation of patient details will be name of the patient, age, sex and presence or absence of hypertension. Imported to SPSS and variables were defined.

## Data analysis:

We considered age, gender and prevalence of hypertension in completely edentulous patients as presence and absence of hypertension. We categorised age as 6 groups [ 25-35, 36-45, 46-55, 56-65, 66-75, 76-85 ] and then based on age group, we scored the data as 25-35 as 1, 36-45 as 2 so on... Then we categorised gender and scored as Male [1], female [2]. Finally we categorised presence or absence of hypertension and scored the data like presence of hypertension as [1], absence of hypertension as [2].

After checking and coding the responses, we used SPSS for data entry and data analysis. Descriptive statistics like frequency and percentage were calculated for categorised variables. We performed Chi square test and cross tabulation between presence or absence of hypertension, age, gender of the patients. Independent variables will be age, gender and Dependent variables will be hypertension. Cross tabulation and chi square test was done for age and presence or absence of hypertension, gender and presence or absence of hypertension. Statistical significance was determined using P value less than 0.05.

## Results and Discussion

This retrospective study included 915 patients

reported to Private dental institutions. Bar graph shows the distribution of the study population based on age groups. prevalence of completely edentulous patients is more common in 56-65 years of age groups ( Graph 1) Bar graph shows the distribution of the study population based on gender . Among 915 patients , 58.8% were males and 41.2% were females. Prevalence is more common in Male compared to females.(Graph 2) Bar graphs show the distribution of the study population based on presence or absence of hypertension. It is evident that the presence of hypertension will be 20.3% and absence of hypertension will be 79.7%. (Graph 3) Bar chart depicting association between gender and presence or absence of hypertension in completely edentulous patients. Association between gender and presence or absence of hypertension in completely edentulous patients was done using chi square test ( $p=0.952$ ) and was found statistically non-significant ( $p>0.05$  )(Graph 4). Bar chart depicting association between age groups and presence or absence of hypertension in completely edentulous patients. Association between age groups and presence or absence of hypertension in completely edentulous patients was done using chi square test ( $p=0.007$ ) and was found statistically significant ( $p<0.05$ ) ( Graph 5)

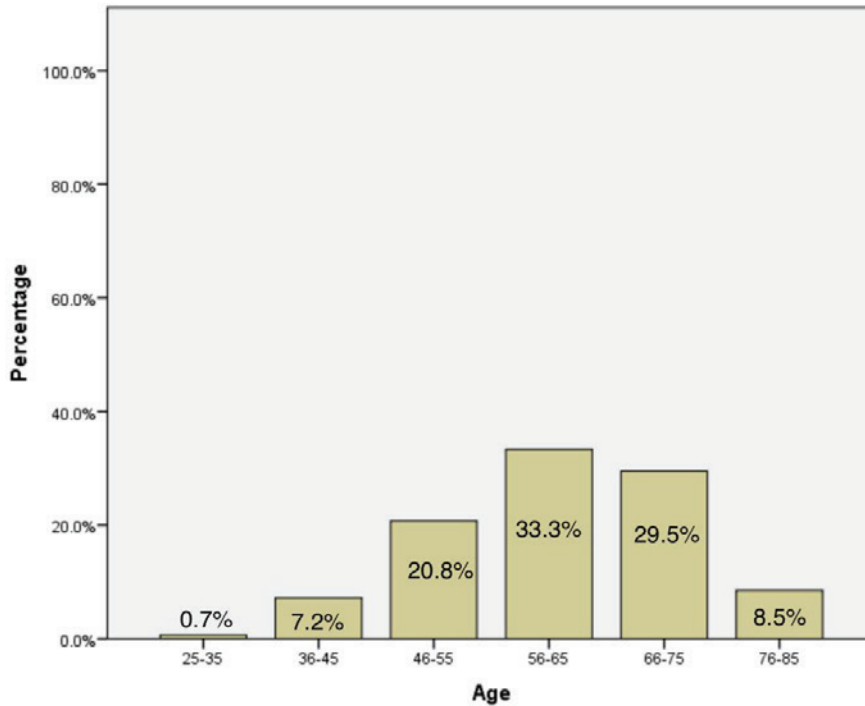
Oral health is fundamental for general health, functioning and well-being. The Global Burden of Disease 2010 Study estimated that oral conditions (untreated caries, severe periodontitis and severe tooth loss) accounted for almost 3 % of all years lived with disability. Edentulism is a final marker of disease burden for oral health common among older adults populations. Various research aimed at improving oral health should take into account social as well as biological determinants. Prevalence of hypertension was significantly different in China and South Africa ( $p<0.001$ ) compared to other countries.

This retrospective study was done to determine the

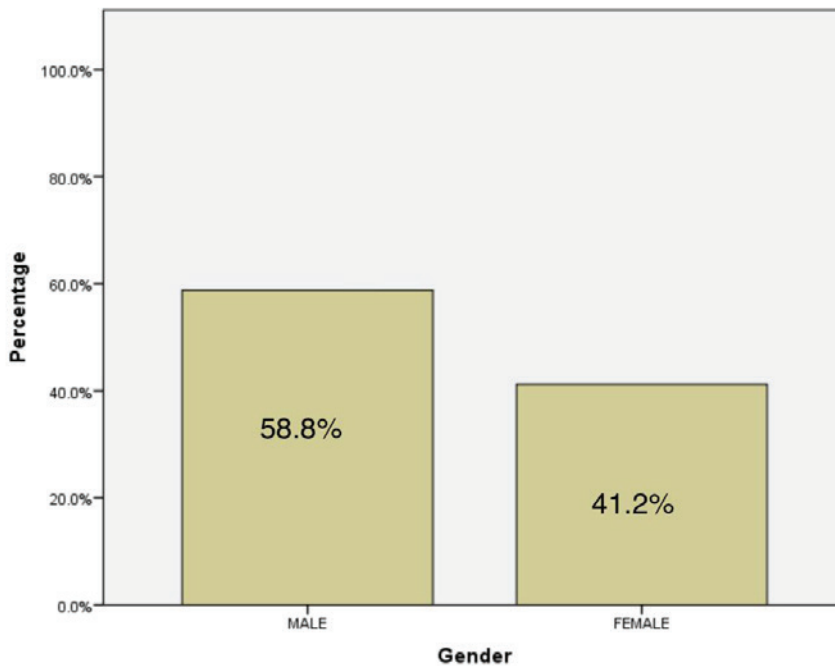
prevalence of hypertension in completely edentulous patients. In this study , prevalence of completely edentulous patients were more common in (56-65) years of age . It is more common in Male compared to female . Prevalence of hypertension was common around (56-65) years of age and with Male predominance . P value less than 0.05 will be statistically non significant. Laxman Singh Kaira et al reported similar evidence that prevalence was common in (51-65) years of age .<sup>29</sup>

However, our study followed a similar protocol to the above mentioned study but our results differed from their study i.e Enami et al., reported a different evidence that prevalence of completely edentulous patients were more common above 70 years of age.<sup>30</sup> Nonetheless, several studies have reported an association between tooth loss and hypertension.<sup>31</sup> In cross sectional study Mustafa Al.Ahmad et al., found that tooth loss is significantly associated with hypertension in post menopausal women.<sup>32</sup>Prevalence of completely edentulous patients more in Male compared to females . Laxman et al., reported similar evidence that the prevalence is more common in Male but Mitsuhiro Sanada et al., reported different evidence that post menopausal women had more prevalence compared to male.

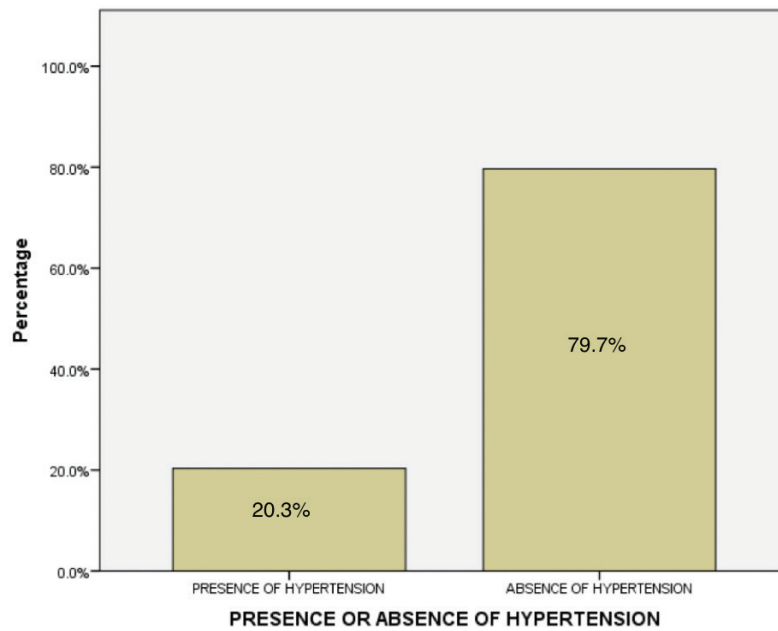
Prevalence of hypertension were more common in (56-65) years of age in completely edentulous patients with male predominance. Akira Taguchi et al., reported that post menopausal women had more prevalence compared to male. Ayo - Yusuf et al., reported similar evidence (50-59) years of age had more prevalence of hypertension.<sup>33</sup> Correlations between age and presence or absence of hypertension were analysed and found to be significant ,whereas correlations between gender and presence or absence of hypertension were analysed and found to be statistically non significant.Limitation of the study was relatively small sample size , single centred study and non representation of all ethnic groups or populations.



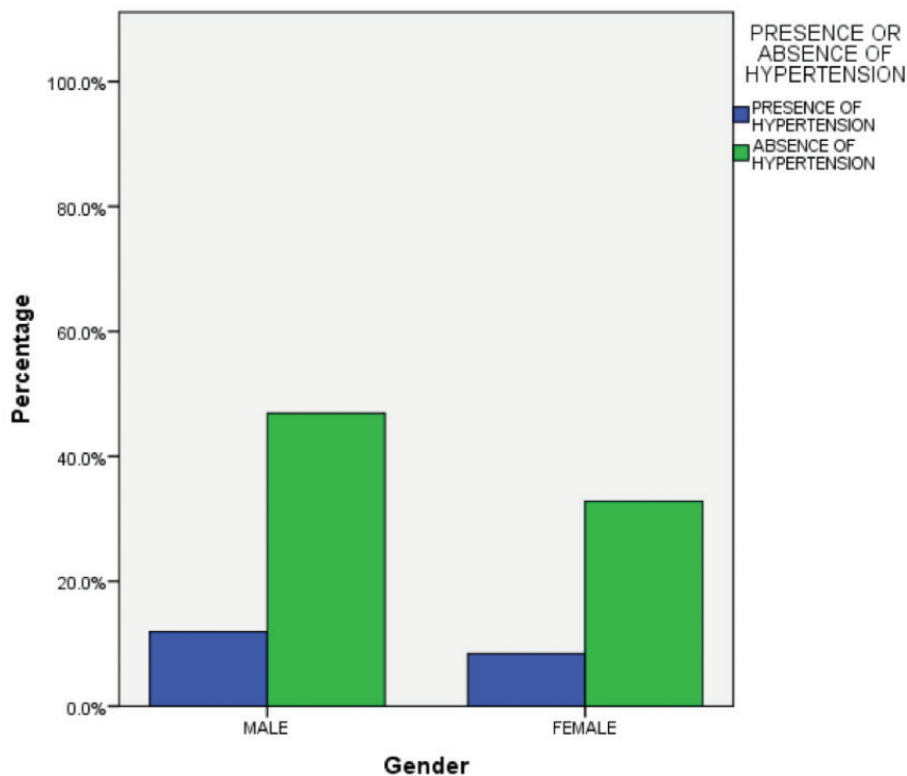
**Graph 1:** This graph represents percentage distribution of study population based on age groups . Bar graph shows the distribution of the study population based on age groups. The X axis represents the age group and the Y axis represents the numbers of patients. It is evident that prevalence of completely edentulous patients is more common in 56-65 years of age groups



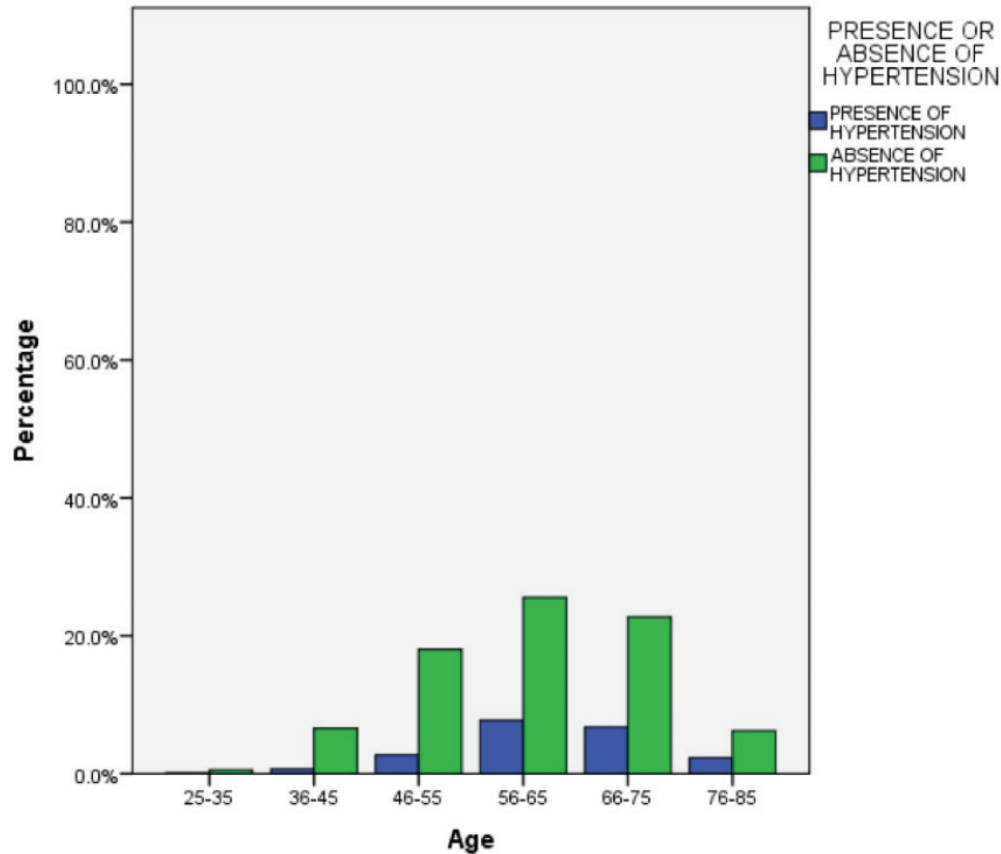
**Graph 2:** This graph represents percentage distribution of study population based on gender . Bar graph shows the distribution of the study population based on gender . The X axis represents gender and the Y axis represents the numbers of patients. Prevalence is more common in males compared to females.It is evident that 58.8% were males and 41.2% were females.



Graph 3: This graph represents percentage distribution of study population based on presence or absence of hypertension. Bar graph shows the distribution of the study population based on presence or absence of hypertension. The X axis represents presence or absence of hypertension and the Y axis represents the numbers of patients. It is evident that the presence of hypertension will be 20.3% and absence of hypertension will be 79.7%.



Graph 4: Bar chart depicting association between gender and presence or absence of hypertension in completely edentulous patients. X axis represents gender and Y axis represents numbers of patients where blue colour denotes presence of hypertension and green colour denotes absence of hypertension. Association between gender and presence of hypertension in completely edentulous patients was done using chi square test and was found statistically non significant (  $P= 0.952, P>0.05$  )



**Graph 5:** Bar chart depicting association between age groups and presence or absence of hypertension in completely edentulous patients. X axis represents age groups and Y axis represents numbers of patients where blue colour denotes presence of hypertension and green colour denotes absence of hypertension . Association between age groups and presence or absence of hypertension in completely edentulous patients was done using chi square test and was found statistically significant (  $P=0.007, P<0.05$  ).Hypertension was more prevalent in the age groups 56-65 and 66-75 years when compared to other age groups.

### Conclusion

Within the limits of the study , prevalence of completely edentulous patients is more common (56-65) years of age and Male are more commonly affected. Hypertension prevention was more common in Male compared to females. While studies are yet exploring the prevalence of hypertension , it is essential that these findings need to be discussed with primary care providers. Further studies on inter professional practice among dentists and physicians in management of hypertension.

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**Conflict of Interest :** Nil

**Ethical Clearance:** It is taken from “Saveetha Institute Human Ethical Committee” (Ethical Approval Number- SDC/SIHEC/2020/DIASDATA/0619-0320)

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