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4 Year Pattern of Conservative Treatment Rendered To Patients Attending the Restorative Clinic in a Tertiary Institution In Lagos

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Abstract
Aim / Objective: *To determine the pattern of treatments performed in the conservative clinic of the department of Restorative Dentistry of Lagos State University Teaching Hospital, (LASUTH) Nigeria over a period of 4 years.*
Materials and Methods:
Three thousand and seventeen clinical records of patients treated from January 2016 to December 2019 were retrieved and recorded. Data collected were age, sex, occupation, and treatment done. Conservative treatment obtained includes; temporary dressing TID, amalgam, glass ionomer GIC, and composite restorations root canal treatment (RCT), crown and bridgework. Data collected were analyzed using SPSS version 20.0. Level of significance was set at P<0.05 and Confidence interval (CI) of 95%
Results:
A total of 4134 procedures were performed on 3017 patients during the study period. The age range was 16 to 78years with a mean of 37.2 ±7.4years. Conservative treatment pattern revealed that age group 45years and above presented most in the clinic followed by 26-35years age group. Females presented more for treatment with a ratio of female to male 1.4: 1. GIC filling was the most common treatment done. The least treatment performed was apicectomy.
Conclusion: *There was a gradual paradigm shift from mercury based material, which is a more invasive treatment to tooth colored materials which are more conservative (Minimally Invasive Dentistry).*
Keywords: *Pattern of treatment, Conservative clinic, GIC filling, Amalgam filling, Composite filling, Lagos State University Teaching Hospital (LASUTH).*

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I. Introduction

Oral health can be defined as not merely an absence of disease but includes functional aspects, social and psychological wellbeing of an individual. Poor oral health affects the quality of life of an individual. In developing countries such as Nigeria, oral health care system is neither clearly defined nor effectively implemented and as such it is considered less important than the other aspects of general health by the public and the government.[1] The low level of awareness leads to underutilization of oral health facilities, in addition to late presentation in clinic with subsequent complications.[2] Improved oral health awareness ultimately increases dental clinic attendance either for curative or preventive purposes. The rate of dental clinic attendance is one of the methods utilized in assessing oral health behaviour.[3] Dental caries has been considered by WHO to be the most important component of the global oral health disease burden and one of the major causes of visits to the dental clinic.[4] In most developing countries prevalence of dental caries was low until recently when it rapidly increased due to change in lifestyle and diet rich in refined carbohydrates.[4] Certain factors associated with low attendance among the population include cost of treatment, time, fear and distance of dental clinic from homes, socio-economic status, family structure, culture, ethnicity and low awareness.[5,6]Most of the carious teeth in Nigeria are unrestored bringing the restorative treatment need to over 80%.[7] This is high when compared to 10 – 24 % reported in USA.[7] Generally, the reasons for most dental attendance are pain and caries as well as its complications. Time of presentation determines the treatment options for patients.[8] In a study by Folaranmi et al, it was discovered that most visits to the hospital were symptomatic visits, and as such 68.2 % of the study group had caries and its sequeale.[6] Therefore, late presentation of patients in the clinic, results to low rate of restorative treatment relative to extraction. Another study done in Enugu revealed that young children and young adults attended dental clinics more than the other age groups.[3] In a study that focused on the turnout of patients in a dental clinic, of all the patients seen, 39.1% received restorative treatment while 37.4% had extraction done, this

was probably due to low cost of extraction or late presentation to the clinic.[9] In a similar study in the advanced world, carried out in a state funded primary health centre, it was reported that, of the 2782 adult patients treated, 51% had tooth restoration and 21.5% had extraction.[10] The type of treatment received in restorative clinic depends on the patient's symptoms, signs and diagnosis. This varies from simple Glass ionomer cement (GIC), amalgam and composite fillings to advance root canal therapy, apicectomy as well as crown and bridges. Based on the present prevailing principle of minimal invasive dentistry, there is a paradigm shift to tooth coloured restorative materials thus GIC and composite materials are gaining ground for the restoration of posterior and anterior teeth.[11] Despite the advocation for phasing down the use of amalgam in restoration of teeth, which was adopted in 2009 at the Geneva congress, many people in our region, Nigeria still rely more on amalgam.[12] In the latest report on The Minamata Convention on Mercury which was enforced in 2017, this obliged parties to take selected measures to phase down the use of dental amalgam, a common mercury containing dental filling material. Measures include setting of national objectives aimed at dental caries prevention and oral health promotion likewise encouraging insurance policies and programmes that favour the use of high-quality alternatives to dental materials (such as GIC and composite) for dental restoration.[13]In a study by Enabulele and Ehizele, on pattern of restoration of permanent molars, it was documented that amalgam restoration accounted for 83.5% of the restored teeth and composite, only 1.2 %.[14] Studies have shown that data collected from patient management systems or records are often used to describe national trends in treatment requirements of patients, monitor and negotiate contracts with health care providers (including suppliers of medical and dental materials/equipment) and finally predict future demands of patients and health providers.[10] In view of this the aim of this study is to determine pattern of treatments done in the conservative clinic which will inform the types of dental materials to be made readily available by the management to run a cost effective and equitable restorative clinic as well as to find out if our institution (LASUTH) is complying with the Minamata Convention shift to mercury free restorative materials in the management of affected teeth. Only a few studies have focused on the types of conservative treatments performed in restorative dentistry while the majority focused more on treatments in general dentistry. Hence this study is to determine the pattern of treatments rendered in conservative unit of restorative clinic of a tertiary hospital (LASUTH).

II. Material And Methods

This was a four-year retrospective study of clinical records of patients treated in the conservative unit of the Restorative Dentistry department of the Lagos State University Teaching Hospital from January 2016 to December 2019. Data were retrieved from the daily attendance books in the clinic using convenience sampling method. Dental records considered in this study were for patients who received conservative treatments and procedures that were fully recorded in the case notes. Reviewed patients were excluded from this study. Data collected were age, sex, occupation, and treatments done on patients. The treatment assessed were the specific procedures done in the conservative unit (temporary dressing, amalgam, GIC, composite fillings, root canal treatment RCT, crown and bridge). Regarding RCT, only obturated teeth were recorded. The number of visits by the patient for RCT was not included.Data was extracted into Microsoft excel (version 2013) and analysed using SPSS for Windows Version 25.0 (SPSS Inc Chicago IIIinois, USA). Frequency and percentage were presented for categorical data while numeric variables were presented using mean and standard deviation. Association between categorical variables was assessed using Chi square test. The level of significance was set as $P<0.05$ at CI 95%.

III. Result

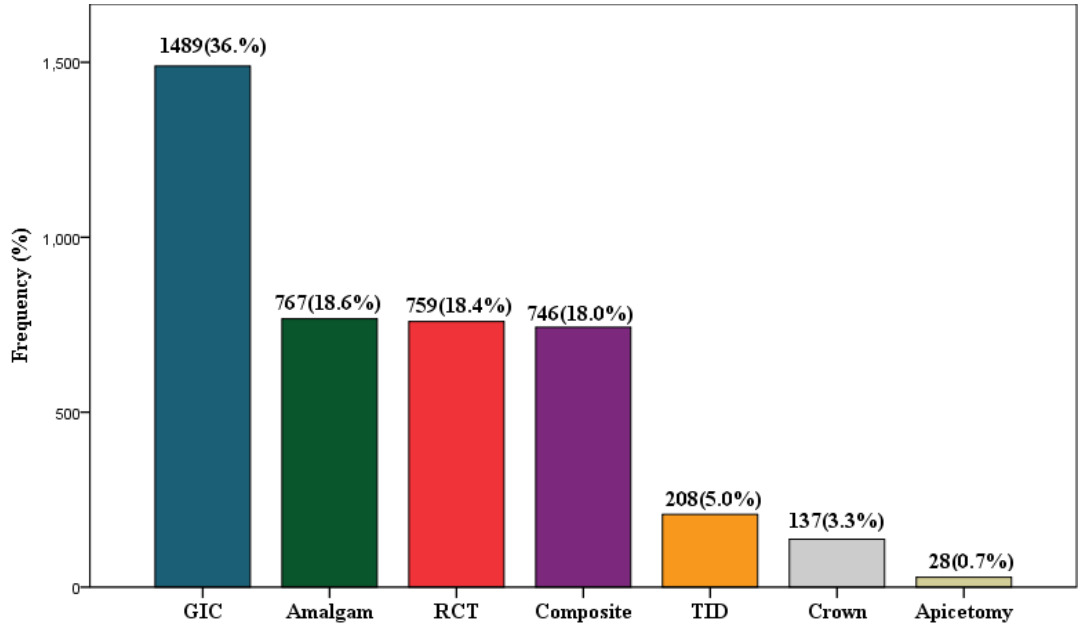
4134 treatments were performed on 3017 patients with complete records for this 4 – year retrospective study. The age range was 16 to 78years. The mean age was 37.2±7.4 years. The highest number of patients was found within age group were aged 45years and above, while the least was found within age group 36-45years (Table 1).

Table 1: Socio-demographic characteristics of subjects

	Frequency(n=3017)	Percentage (%)
Age group (Years)		
16-25	662	21.9
26-35	787	26.1
36-45	627	20.8
>45	941	31.2
Gender		
Male	1229	40.7
Female	1788	59.3
Occupation		
Student	597	19.8
Trader	354	11.7
Civil servant	364	9.7

Retired	293	9.7
Others	1409	46.7
Year		
2016	697	23.1
2017	736	24.4
2018	861	28.5
2019	723	24.0

Throughout the 4 years of retrospective study, the number of females was constantly higher than males. The ratio of female to male was 1.4:1. GIC filling was the most common treatment done (36%), this was almost equal to the sum of amalgam (18.6%) and composite (18%) restorations. The number of amalgam, composite and RCT restorations done were almost of equal proportions. The least frequently performed treatment was apicectomy (7%) (Figure 1). **Figure 1:** Pattern of treatment performed on patients (n = 4134)



With increasing age, GIC and Composite fillings were found more in 36-45years and above 45years age groups (Table 2). GIC treatment was higher in females (38.3%) than males (33.1%) (Table 2).

Table 2: Association between age groups, gender and treatment performed

	16-25	26-35	36-45	>45	p-value
Treatment					
Amalgam	138(18.0)	217(28.3)	247(32.2)	165(21.5)	<0.001*
Composite	126(16.9)	179(23.6)	188(25.2)	253(33.9)	
GIC	348(23.4)	131(8.8)	329(22.1)	681(45.7)	
RCT	207(27.3)	195(25.7)	145(19.1)	212(27.9)	
Crown	25(18.2)	59(43.1)	33(24.1)	20(14.6)	
TID	61(29.3)	68(32.7)	58(27.9)	21(10.1)	
Apicectomy	9(32.1)	13(46.4)	4(14.3)	2(7.1)	
	Male		**Female**		**p-value**
Treatment					
Amalgam	365(20.1)		402(17.4)		0.001*
Composite	310(17.1)		436(18.8)		
GIC	601(33.1)		888(38.3)		
RCT	369(20.3)		390(16.8)		
Crown	60(3.3)		77(3.3)		
TID	100(5.5)		108(4.7)		
Apicectomy	13(0.7)		15(0.6)		

The number of treatments done was highest in 2018(31.4%) and lowest in 2017(15.7%) (Table 3)

Table 3: Pattern of treatments performed per year

	2016 (n=946) 22.9%	2017 (n=648) 15.6%	2018 (n=1297) 31.4%	2019 (n=1243) 30.1%
Gender				
Male	336(35.5)	319(49.2)	562(43.3)	601(48.8)
Female	610(64.5)	329(50.8)	735(56.7)	642(51.6)
Treatment				
Amalgam	176(18.6)	173(26.7)	198(15.3)	220(17.7)
Composite	208(22.0)	105(16.2)	300(23.1)	133(10.7)
GIC	300(31.7)	144(22.2)	460(35.5)	585(47.1)
RCT	157(16.6)	147(22.7)	248(19.1)	207(16.7)
Crown	14(1.5)	22(3.4)	49(3.8)	52(4.2)
TID	83(8.8)	52(8.0)	36(2.8)	37(3.0)
Apicectomy	8(0.80)	5(0.8)	6(0.5)	9(0.7)

IV. Discussion

This study was done to determine the routinely collected data on conservative treatment performed on patients attending the Restorative department of Lagos State University Teaching Hospital (LASUTH) Ikeja in order to negotiate contracts with dental health providers, prepare budgets and make provisions for future needs of patients.

The study showed significant increase in the use of GIC and a decline in the use of amalgam. The use of GIC restoration was almost equal to the summation of that of composite and amalgam restorations. This increase occurred gradually over the years. These changes might be due to increased awareness of advantages of GIC over amalgam, the negative implications of mercury based materials resulting to the phasing down of mercury amalgam. Other factors that could contribute to this, are cost and tooth colour of the material. GIC is more aesthetic than amalgam and less expensive than composite. Its application is also easier for clinicians as per fewer procedures involved. This outcome is in alignment with the paradigm shift from the use of mercury amalgam to mercury free and more conservative materials.[13]

Most of the patients that presented in the clinic were above 45years and they contributed to the highest number of GIC fillings done in the clinic: 36% in 4 years. The reason may be attributed to age related lesions such as tooth wear (cervical abrasion) and root caries. This study also showed that those aged 45years and above accounted for the highest number of composite treatment and RCT. This corroborates the study done by Soban Khan et al[15] who recorded highest number of RCT in geriatric patients which was said to be due to increase in incidence of periodontal disease and tooth wear lesions. The result is in contrast to that of Paul Ikhadaro and Osadolor[16] who reported that middle aged individuals accounted for highest number of RCT.

In this study apicectomy was more prevalent among the age group of 26 – 36 years (46.4%), this was in agreement with the study of Ajayi et al[17] who discovered that age 21 – 30 years accounted for 67% of apicectomy in their research. Likewise the study of Ankital Agrawal[18] showed that 31-40 years age group had the highest prevalence of apicectomy. While age group 45 years and above was the least (7%).

Majority of subjects in this study were females (59.3%). This could be attributed to the fact that females seek for treatment due to greater interest in aesthetics and general wellbeing. This was further buttressed by the percentage of females that presented for GIC and composite fillings which were (38.3% and 18.8%) while males were (33.1% and 17.1%) respectively. Males probably reported for treatment mainly due to pain and function. This is shown by the higher percentage of males that presented for amalgam and RCT (20.1% and 20.3%) compared to females (17.4% and 16.8%) respectively. These results were in accordance with some studies of Osadolor, Ahmed and Agrawal.[18.19,20]

V. Conclusion

More adults (45 years and above) presented for treatment than younger age groups. There were more females (56%) than males. The most commonly performed treatment was GIC filling (36%). This was followed by amalgam (18.6%), RCT (18.4%), and Composite (18%) fillings. The least was apicectomy (0.7%). These show a gradual paradigm shift from mercury based materials, a more invasive treatment to tooth coloured materials which are more conservative procedures (Minimally invasive dentistry). This study will aid budget planning and improve the efficiency of health service delivery.

VI. Limitations

There were limitations of incomplete records which is typical of retrospective researches but this was considered and compensated for in this study by the large sample size of over 4 years retrospective study thus boosting the validity of the study.

VII. Recommendation

The authors recommend that there should be research into the cost of each treatment performed and that of all dental materials used in Restorative dentistry as a whole for ease of planning, budgeting and policy making.

Conflict of Interests / Competing Interests: No conflicts of interest

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