Oral epidemiological profile of patients attending public oral health services in Haut Sassandra region, in Côte d'Ivoire

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Abstract

The objective of this cross-sectional study was to determine the type of care that can be achieved and the epidemiological profile of patients attending the 3 public dental practices in the Haut-Sassandra region, in Côte d'Ivoire. The data collection concerned socio-demographic characteristics, reason for consultation, oral hygiene, dental condition, malocclusions and the availability of equipment for the performance of procedures. The 400 patients observed (51.5% male) were aged 16.0 to 86.0 years (mean=35.5 years; SD=13.1 years). The main reasons for consultation were pain (91.5%) and aesthetics (23.5%). Oral hygiene was insufficient for 36.8% of subjects. Oral conditions were malocclusions (12.8%), caries (98.7%) and edentulous (65.7%) with only 11.8% with prosthesis. The average DMFT index was 9.3. Only extractions and resin attached prostheses were possible in all 3 health facilities. Preventive dentistry (sealent, fluoridation), dentofacial orthopedics and implantology were not available in any dental practice. The most frequently performed acts were extractions (74.5%). The results of this study highlight the need for oral health planning with service equipment and awareness among populations who shouldn't wait until they are in pain to consult.

Introduction

The high frequency of oral diseases, their impact on general health and quality of life make them a public health issue. According to the 2016 Global Burden of Disease Study, half of the world's population (3.58 billion) suffers from oral diseases.[1] Their distribution and severity vary from one part of the world to another and within the same region or country. If not managed, these conditions can cause pain and infection, including focal infections, with a significant impact on school attendance and performance in children, but also on the quality of life of those affected, including adults and the elderly.[2-5] In addition, the management of oral diseases is extremely costly and can constitute a major socio-economic burden for individuals and health systems.[4] The economic burden is high in both developed and developing countries.[6] Therefore, epidemiological data on the oral health status of populations are essential for decision-makers and even local authorities to develop effective policies for disease prevention and health care planning. In Côte d'Ivoire, the oral health status of the population is not well known due to the scarcity of surveys conducted in this area. There has been no national survey since Guinan *et al.* conducted on school-age children in 1996.[7] Most of the epidemiological data available in Côte d'Ivoire concern the Abidjan region,[8-10] and these data are insufficient to serve as a basis at the national level. This justifies conducting surveys at the regional level, in the absence of a national survey in order to have, in the long term, information on the oral health of the population throughout the country. Thus, in 2013, a first regional survey was carried out in the Yamoussoukro Autonomous District.[11] It is in the same vein that we conducted in 2016, an epidemiological survey on oral health in the «Haut Sassandra Region» (HSR) which is the 2nd most important region in the country, in terms of population, after the Lagoons region.[12] The objective of this study was to determine the type of care that can be achieved and the oral epidemiological profile of patients attending public dental services (PDS) in the HSR, in Côte d'Ivoire.

Materials and Methods

Study design

This is a cross-sectional descriptive survey conducted over a period of 3 months (August to October 2016) in the PDS of the Haut Sassandra Region (HSR), in Côte d'Ivoire.

The «Haut Sassandra Region»

The study was conducted in the Haut Sassandra Region (HSR) located in the Center-West of Côte d'Ivoire. It has three health districts: Daloa, Issia and Vavoua. Each health district has a public dental service (PDS) run by 2 dentists and housed in the local reference hospital: in Vavoua and Issia, in the General Hospital (GH) and in Daloa, in the Regional Hospital Center (RHC). With 1,620,066 inhabitants, the number of dentists per inhabitant of the HSR is one dentist per 270,011 inhabitants.

Sampling

The eligible population for this survey

was subjects aged 16 years or older who came for first consultation in one of the 3 PDS of the HSR during the survey period. Patients who came for follow-up visits and treatment were excluded from the sampling. Since there is no pedodontist in the region, the pediatric population defined by children under 15 years of age has not been taken into account either. All subjects meeting the inclusion criteria, who visited the centre during the month of our presence were systematically included. Informed consent was obtained before data collection.

Data collection

The data were collected from a questionnaire and an oral clinical examination carried out by a single investigator who spent 1 month in each of the 3 dental offices. The questionnaire and oral clinical examination form used have been previously tested at the Odonto Stomatological Consultation and Treatment Center at the University Hospital of Cocody in Abidjan.

The questionnaire collected socio-demographic characteristics (age, sex, residence, profession, etc.) and the reason for consultation. A subject could have several reasons for consultation. The various reasons for consultation reported by patients were noted and then treated as binary variables (absence or presence). During the clinical examination, the data collected were whether or not there was a malocclusion, as well as oral hygiene assessed from the Oral Hygiene Index Simplified (OHIS)[13] and dental condition assessed from the Decayed, Missed and Filled Teeth (DMFT) index.[14,15] The malocclusion evaluated as a binary variable took into account all disorders of the dental joint such as deficit or excess overhang, gaps, misalignment of teeth, incisal overlapping. For each dental service, the capacity of performing the various dental surgery procedures was assessed by the availability of the technical platform (equipment, materials) and the ability of practitioners to perform these procedures; this capacity was assessed according to their declaration.

Data analysis

The data collected on paper were entered into the EpiData 3.1 software and then exported to the EpiInfo 6.4 software for statistical analysis. Occupations were grouped were grouped into 3 socio-economic categories according to the National Institut of Statistics classification based on the activities carried out by individuals: high, medium and low.[16] The high category includes, among others, middle and senior managers in the public, private and military sectors. The medium category includes civil servants, agents and employees in the private sector such as officers pharmacy assistants, high school teachers, military and paramilitary sub-officers, teachers. The low category includes: non-salaried workers, pupils and students, the unemployed, actors in small trades. Based on OHIS scores, Oral hygiene was classified as "Good: OHIS<1.3", "Medium: 1.3<OHIS≤3.0" and "Insufficient: OHIS>3". Frequencies with 95% confidence intervals and means calculations were performed for the description of the different variables.

Results

Socio-demographic characteristics

In total, 400 patients were observed in this study with more than half of them male (51.5%). The age ranged from 16.0 to 86.0 years (median: 33.5 years) with an average of 35.5 years (SD: 13.1 years). The majority of subjects (56.0%) were under 36.0 years of age; less than one-third (30.3%) were from rural areas and the vast majority were in the low socio-economic category (79.0%) with only 2.0% in the high socio-economic category. Table 1 presents the distribution of the sample by socio-demographic characteristics and the health facility visited.

Oral condition

The main reasons for consultation were pain, aesthetics and gingival bleeding with more than 90% of patients coming for pain and 8.5% for gingival bleeding (Figure 1). Oral hygiene was considered insufficient for 147 patients or 36.8% compared to 3.3% with a good oral hygiene. The frequency of dental malocclusions was estimated at 12.8%, the vast majority of patients had at least one decayed tooth in the mouth, (98.7%); nearly 2/3 had at least one missing tooth (65.7%) and among the 263 edentulous, only 31 or 11.8% had a prosthesis (Table 2). The mean DMFT index was 9.3 teeth (SD: 5.4) with 284 subjects or 71.0% of patients with more than 3 decayed teeth in mouths. The calculated DMFT index was dominated at 62.8% by the decayed teeth index 'D' compared to 9.6% for the "M" index component of filled teeth (Table 3).

Dental care procedures

Conservative dentistry and endodontics (CDE), as well as periodontology, including scaling (manual or ultrasound), were not possible at the GH of Vavoua. Only dental extractions and resin prostheses were possible in all 3 health facilities at the same time. Preventive dentistry (sealent, fluoridation), dentofacial orthopedics and implantology were not available in any dental service (Table 4). At the time of the survey, 9 out of 10 patients (88.0%) had at least one tooth to extract in the mouth. The most frequent clinical interventions performed on the day of the survey were dental extractions which were performed in 298 of the 400 patients

Table 1. Sample distribution according to socio-demographic characteristics and the health facility visited. Oral survey in the Haut Sassandra Region, in Côte d'Ivoire. N=400.

| Variables	Effective (n)	% [95% CI]
Sex		
Female	194	48.5 [43.6-53.4]
Male	206	51.5 [46.6-56.4]
Age (years)		
16 - 25	97	24.3 [20.3-28.7]
26 – 35	127	31.7 [27.4-36.5]
36 - 45	98	24.5 [20.5-28.9]
46 - 55	48	12.0 [9.2-15.6]
56 - 65	17	4.2 [2.7-6.7]
66 - 75	10	2.5 [1.4-4.5]
76 – 85	3	0.8 [0.3-2.2]
Socio-economic category		
Low	316	79.0 [74.7-82.7]
Medium	76	19.0 [15.5-23.1]
Hight	8	2.0 [1.0-3.9]
Health centers		
RHC Daloa	174	43.5 [38.7-48.4]
GH Vavoua	101	25.3 [21.2-29.7]
GH Issia	125	31.2 [26.9-36.0]
Residence aera		
Rural	121	30.3 [26.0-34.9]
Urban	279	69.7 [65.1-74.0]

GH: General Hospital; RHC: Regional Hospital Center.

observed, or 74.5%; all other treatments (conservative dentistry and periodontology) concerned only 125 patients, or 31.3% (Table 2).

Discussion

This cross-sectional survey made possible to determine the oral epidemiological profile of patients attending the 3 PDS of the HSR. In addition to oral health conditions, several parameters were assessed, including the origin of patients, the reason for consultation, the type of procedures performed and the ability of facilities to provide the various oral health services. As the survey was carried out in healthcare settings, the sample of subjects observed is not representative of the population of the HSR, let alone the ivorian population. Nevertheless, this survey, which includes all PDS of the HSR in a comprehensive way, provides interesting data on the availability and operational capacity of public oral health care services. It also provides a good approximation of the frequency of oral diseases based on the epidemiological profile of patients attending PDS in the HSR.

The DMFT index estimated at 9.4 in this study and dominated by decayed teeth at 62.8% as well as the high frequency of dental caries which concerns almost all of the subjects observed (98.7%) show that dental caries remains the most frequent oral disease in the HSR. This observation is consistent with the results of other available studies on the distribution of oral diseases in Côte d'Ivoire[9-12] and other countries.[17,18] The main reason for consultation identified in this study was pain. This is also consistent with the results of many studies that cite pain as the main reason patients seek dental care.[19] Pain-induced consultations are late consultations that may require complex and sometimes expensive treatments. In addition, the rotating instrumentation is not always functional in dental health services, forcing dentists to opt for extractions,
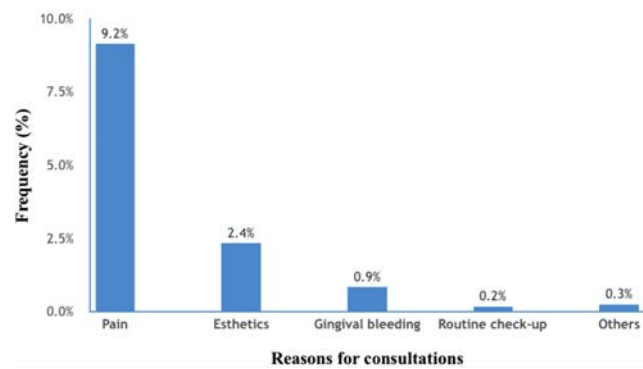
Figure 1. Representation of the main reasons for consultation. Oral survey in the Haut Sassandra Region, in Côte d'Ivoire.

Table 2. Sample distribution according to odonto-stomatological characteristics. Oral survey in the Haut Sassandra Region, in Côte d'Ivoire. N=400.

Variables	Effective (n)	% [95% CI]
Oral hygiene		
Good	13	3.3 [1.9-5.5]
Medium	240	60.0 [55.1-64.7]
Insufficient	147	36.7 [32.2-41.6]
Malocclusion		
Yes	51	12.8 [9.8-16.4]
No	349	87.2 [83.6-90.2]
Number of decayed teeth		
0	5	1.3 [0.5-2.9]
1-3	111	27.7 [23.6-32.3]
4-6	120	30.0 [25.7-34.7]
7-9	84	21.0 [17.3-25.3]
10 and more	80	20.0 [16.4-24.2]
Number of missing teeth		
0	137	34.3 [29.8-39.0]
1-3	167	41.7 [37.0-46.6]
4-6	65	16.2 [13.0-20.2]
7-9	15	3.8 [2.3-6.1]
10 and more	16	4.0 [2.5-6.4]
Use of dental prostheses (n=263 edentulous)		
Yes	31	11.8 [8.4-16.2]
No	232	88.2 [83.8-91.6]
Number of teeth to be extracted		
0	48	12.0 [9.2-15.6]
1-3	213	53.2 [48.4-58.1]
4-6	100	25.0 [21.0-29.5]
7-9	22	5.5 [3.7-8.2]
10 and more	17	4.3 [2.7-6.7]
Dental care performed during the session		
Extractions	298	74.5 [70.0-78.5]
Conservative care (dentistery and descaling)	125	31.3 [26.9-36.0]
Protheses	1	0.3 [0.0-1.4]

Table 3. Numbers of teeth Decayed (D), Missed (M), Filled (F) and DMFT index according to agefor patients examined during the oral survey in the Haut Sassandra Region, in Côte d'Ivoire. N=400.

Variables	Decayed index Mean (SD)	Missed index Mean (SD)	Filled index Mean (SD)	DMFT index Mean (SD)
Age (years)				
16 - 25	5.9 (3.7)	1.0 (1.3)	0.6 (1.3)	7.5 (4.2)
26 - 35	5.7 (3.7)	1.9 (2.7)	0.8 (1.7)	8.4 (4.6)
36 - 45	6.0 (3.7)	2.5 (2.5)	1.3 (3.3)	9.6 (4.6)
≥ 46	5.9 (4.2)	5.7 (6.2)	1.0 (1.9)	12.5 (7.0)
All subjects	5,9 (3,8)	2.6 (3.8)	0.9 (2.2)	9.4 (5.4)
Proportion in the DMFT index	62.8%	27.6%	9.6%	100%

SD: standard deviation; DMFT: Decayed (D), Missed (M), and Filled (F).

sometimes even for teeth that can be conserved. The results of our study, which identifies dental extraction as the main care performed at the time of the survey, confirm this argument, which is unique to developing countries where pain and lack of equipment for other treatment options are the main reasons given for dental extractions.[20-23] In addition, most of these extractions are not compensated by dental prostheses. In our study 65.7% of patients had at least one tooth missing but only 11.8% of edentulous patients had a dental prosthesis. These results are similar to several studies in the ivorian population that found similar frequencies of uncompensated gaps.[8,11] The low compensation for gaps in our study can be explained by the lack of financial resources of this study population, 79.0% of which are individuals with a low socio-economic level. The frequency of malocclusions estimated at 12.8% in our study is similar to that reported by other studies conducted in Côte d'Ivoire in the Abidjan region.[9-11] Recommendations for regular follow-up visits to the dental surgeon are far from being met in our study population, in which less than 2% of patients came for routine check-ups. This result indicates a lack of interest and/or awareness of the importance of the recommended follow-up visits to the dentist. Our results reveal that the accessibility of oral health care to HSR populations is limited by the low number of dental offices (only three) and dentists, and the weakness of the technical platform. In 2016, there were 6 dentists for the estimated HSR population of 1,620,066 inhabitants, a density of 1 dentist per 27,0011 inhabitants, far below the WHO recommended standard of 1 dentist per 10,000 inhabitants. In addition to the limited number of PDS in the HSR that significantly reduce the accessibility of oral health care to populations, in existing dental offices, some care is not feasible. Indeed, an analysis of the supply of oral health care in the HSR shows that no public dental practice provided all the care. Only dental extractions and resin prosthetic rehabilitations could be performed in the 3 dental practices surveyed. Traditional conservative dentistry and periodontology such as scaling were not possible at the HG de Vavoua, nor were fixed prostheses. For the Daloa Regional Hospital Center, the reference hospital for the HSR, metallic assistant prostheses and fixed prostheses were not feasible. The unavailability of care can be explained (at least in part) by the lack of competence of these practitioners who declared that they were unable to perform certain acts that were nevertheless well learned and validated during the initial formation. Preventive dentistry procedures such as sealants and fluorations, as well as dentofacial orthopedics and implantology procedures were not available in any of the 3 dental practices. However, several studies confirm the reality of orthodontic care needs in the African context.[24,25]

Conclusions

This study determined the epidemiological profile of patients attending oral health services of the RHS. The impossibility of conservative dental care and scaling due to the lack of functional rotating instrumentation poses a problem for the equipment of public dental practices in the country. This study highlights the need for oral health planning with service equipment. Instead of waiting for the central administration, health professionals can rely on local authorities or non-governmental organizations to acquire the minimum equipment necessary for curative and preventive care. These results also suggest health promotion and prevention actions for populations who should not wait until they are in pain to consult. It seems essential in view of these results to create in patients and practitioners the habit of preventive action (oral hygiene, control visits and systematic screening). In the absence of a national survey involving all health regions of Côte d'Ivoire, several epidemiological studies of this type should be encouraged in other regions in order to establish a national epidemiological profile of patients attending public dental offices based on regional data.

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Table 4. Availability of surgical-dental procedures in the public dental services. Oral survey in the Haut Sassandra Region, in Côte d'Ivoire.

Type of treatment	GH Vavoua	GH Issia	RHC Daloa
Preventive Dentistry (sealant, fluoration)	-	-	-
Endodontics	-	+	+
Extraction	+	+	+
Implantology	-	-	-
Conservative dentistry	-	+	+
Dentofacial orthopaedics	-	-	-
Parodontology	-	+	+
Resin partial adjunct prosthesis	+	+	+
Stellite	-	+	-
Total adjunct prosthesis	+	+	+
Fixed prosthesis	-	+	-
Maxillofacial prosthesis	-	+	+

GH: General Hospital; RHC: Regional Hospital Center; + Available; - Not available.

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