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Morbidity and mortality patterns of medical admissions in a Nigerian secondary health care hospital

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Abstract

Background: Periodic evaluation of morbidity and mortality data in developing countries is required to monitor trends in disease patterns. This study is to determine the prevalence and types of diseases currently seen in a secondary health care facility and compare with previous reports.

Methods: A retrospective study of the medical admissions at the Adeoyo State hospital, Ring Road, Ibadan, over a 5-year period (1996 – 2001).

Results: A total of 2609 patients aged 45.1 ± 19.5 years (range 8 – 98 years) were admitted. There was a male preponderance (53%). Causes of admission included cardiovascular diseases (36.8%) infections (24.9%) which include tuberculosis (1.3%) and HIV/AIDS (2%). Cardiovascular diseases increased by 150% compared with previous report from similar setting. Non-communicable diseases (NCDs) account for 60.7% of all the medical admissions, affected older patients; progressively increased over time and were associated with more proportional mortality rate while communicable diseases were associated with higher case specific fatality rate. The overall mortality rate was 18.9%. Stroke was the leading cause of death, (20%). Other causes were tetanus 61 (12%), meningitis 55 (11%) and congestive cardiac failure 49 (10%). The age specific mortality rate was highest at 65 years of age and above age group.

Conclusion: Cardiovascular diseases and infections are prevalent. There is an increase in non-communicable diseases suggesting changing demographic, social attributes and lifestyle. There is a need for periodic monitoring of trends and feed back to the general public and policy makers.

Keywords: Medical admission, morbidity, mortality, prevalence, disease, secondary health facility.

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Résumé

L'évaluation des données de la morbidité et mortalité dans les pays sous développés est nécessaire pour surveiller l'évolution dans les fréquences des maladies. Cette étude rétrospective des 5 dernières années (1996 – 2001) sur les admissions à l'hôpital d'Adeoyo, Ibadan avait pour but de déterminer la prévalence et les types de maladies couramment diagnostiquées dans le centre de santé et comparer avec les rapports antérieurs. Au total 2609 patients âgés de 45.1 ± 19.5 ans (8 – 98 ans) étaient admis. Le taux de male était de (53%). Les causes de l'admission inclus les maladies cardiovasculaires (36.8%) et les infections (24.9%) qui inclus la tuberculose (1.3%) et le VIH/SIDA (2%). Les maladies cardiovasculaires augmentaient de 150% compare avec d'autres rapports des lieux semblables. Les maladies non transmissibles (MNTs) s'estimaient pour 60.7% des admissions médicales, les patients plus âgés; évolution croissante avec le temps et étaient associés avec plus de proportion de mortalité tandis que les maladies transmissibles étaient associés avec un taux élevée de fatality spécifique. La mortalité totale était de 18.9%. L'arrêt cardiaque était la cause majeure de décès, (20%). Autres causes étaient le tétanos 61 (12%), méningite 55 (11%) et l'échec cardiaque 49 (10%). Le taux de mortalité d'âge spécifique était plus élevé au delà de 65 ans. Les maladies cardiovasculaires et les infections sont prévalences. Il y a également une augmentation des maladies non transmissibles suggérant des changements démographiques, des attribues sociaux et le style de vie. Ainsi, il ya un besoin d'une évaluation périodique de l'évolution et du feed back pour la population et aux politiciens.

Introduction

Periodic evaluation of morbidity and mortality data in developing countries is necessary to observe the changes in disease patterns, assess the impact of changing socioeconomic and lifestyle factors on the disease prevalence and causes of death, and to

determine the public health interventions that are required to address emerging morbidities and mortalities of concern. Unlike the industrialized countries where morbidity and mortality data are routinely captured through a centralized reporting systems that provide nation-wide data, (regardless of the types of health care institutions where treatment is received,) there is a dearth of information on epidemiology of chronic disease in the developing countries of Sub-Saharan Africa [1,2]. The few available studies often obtain data from hospital admissions to tertiary referral health care centres or teaching hospitals [3-6].

Secondary healthcare centres constitute an important source of epidemiological data for determination of prevalence and pattern of disease in Sub-Saharan African countries. Primary health care centres serve relatively smaller populations and may not have adequate infrastructure for record keeping, data reporting and/or analyses. Secondary healthcare centres provide health care for large populations compared with and have better record keeping practices than primary care centres, and are more accessible and affordable to the populace than teaching hospitals. Data obtained from teaching hospitals may not completely be a true reflection of what obtains in the general population because they are referral centres which are often utilized by the high socioeconomic strata of the society and/ persons with severe disease.

One of the problems with morbidity and mortality studies in developing countries is that such studies are infrequent and irregular, data is often not analyzed and many years may pass before data is analyzed and reported for the purposes of disease prevention, healthcare planning or infrastructure development. For example, prior to the present study, last available report on the morbidity and mortality patterns at a secondary health institution in Ibadan, Nigeria, Adeoyo State Hospital was published more than 30 years ago [7]. This secondary healthcare institution is one of the two public hospitals that serve the city of Ibadan [8]. The aim of the present study is to determine patterns of disease morbidity and mortality in a public secondary health care institution in the largest metropolitan city in sub-Saharan Africa [9,10] and to compare the results with previous report in similar region [7]

Materials and methods

Settings

The Adeoyo State Hospital, a 274- bed general hospital with staff strength of 645 employees comprising of 50 doctors, 30 laboratory scientists and technologists, 9 pharmacists, 8 physiotherapists, 245

nurses, 303 paramedical and non-medical staff. There are thirteen departments in the hospital; these include Pharmacy, Maxillo-facial, Physiotherapy, Laboratory, Accident and Emergency, General Out Patient, Medicine, Surgery, Obstetrics and Gynaecology, Radiology, Ophthalmology, Psychiatry and Ear, Nose and Throat. The medicine, surgery and obstetrics and gynaecology departments offer out and inpatient services. Admissions are made through the general out patient department which is essentially a walk- in clinic as well as by referrals from other hospitals and primary health care centres to specialists. The hospital serves residents of the Ibadan metropolis including the surrounding towns and villages in southwest Nigeria. The hospital has two medical wards, one each for male and female patients. Each ward has 26 beds.

Design

The study was a retrospective survey of all cases seen in medical wards of the Adeoyo State Hospital, Ring Road, Ibadan, from September 1996 to December 2001. It is descriptive, analytic and inferential, in that the morbidity and mortality pattern were assessed and compared with a previous study from the same facility.

Study population

All patients admitted in medical wards of Adeoyo State Hospital.

Data collection

Records of all patients admitted in medical wards were retrieved from medical records library. Information collected included the hospital number, age, sex; principal diagnosis and secondary diagnosis. Other information obtained were the date of admission, outcome of admission (dead, alive or referred) and date of outcome. The International Classification of Diseases (ICD 9) was used for coding the diagnosis for each patient [11]. Data was analyzed on a computer using the SPSS for data entry and statistical analysis. Proportions and percentages were used to summarize qualitative data while means, median and standard deviation were used for quantitative data. The student t-test was used to test the significance of differences between continuous variables while non parametric tests; chi-square and Kruskal-Wallis were used for categorical variables. The level of significance determined at p value less than 0.05.

Results

Medical admissions

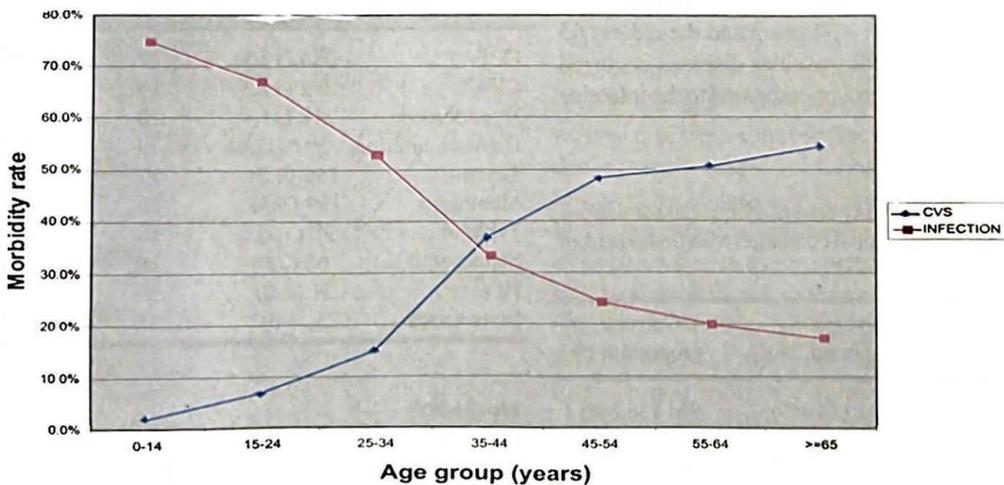
A total of the 2609 records were reviewed. The mean age of patients was 45.1 ± 19.5 years; the range 8 to

Table 1: Sociodemographic characteristics, distribution of sex by age and the duration of medical admissions to the Adeoyo State Hospital, Ring-road, Ibadan from 1996 - 2001.

Characteristics	Female	Male	Total Number	P values
Age Categories (years)	n (%) 1152 (%)	n (%) 1319 (%)	2471	0.006
< 15	51 (4.4%)	74 (5.6%)	125 (5.1%)	
15 – 24	152 (13.2%)	235 (17.8%)	387 (15.7%)	
25 – 34	144 (12.5%)	140 (10.6%)	284 (11.5%)	
35 – 44	147 (12.8%)	164 (12.4%)	311 (12.6%)	
45 – 54	201 (17.4%)	226 (17.1%)	427 (17.3%)	
55 – 64	204 (17.7%)	246 (18.7%)	450 (18.2%)	
≥65	253 (22%)	234 (17.7%)	487 (19.7%)	
Median age (yrs)	48	45	47	
** Mean(sd)age (yrs)	46.3 (19.4)	43.9 (19.7)	45.0 (19.6)	0.011
Range	10 -98	8 – 92	8 – 98	
**Hospital stay	30.05 (23.2)	27.9 (22.6)	28.9 (22.9)	
***mean (sd) (days)				0.213
1 – 5 days	178 (18.3%)	192 (19.4%)	370 (18.8%)	
6 – 10 days	63 (6.5%)	70 (7.1%)	133 (6.8%)	
11 – 15 days	128 (13.2%)	134 (13.5%)	267 (13.4%)	
16 – 20 days	99 (10%)	122 (12%)	225 (11.3%)	
≥21 days	503 (52%)	474 (48%)	991 (49.8%)	

* $\chi^2 = 17.939$, $p = 0.006$; ** $p = 0.011$, *** $p = 0.213$

* 138 patients did not have either the age or the gender indicated, ** 646 had missing values for hospital stay

Fig.1: Pattern of cardiovascular and infectious diseases* distribution by age group among medical admissions at Adeoyo State Hospital, Ring-road, Ibadan from 1996 to 2001.

*Cardiovascular diseases (CVS) include hypertension, congestive cardiac failure, Infections include HIV, tetanus, malaria, meningitis, diarrhoeal diseases, pneumonia

98 years, 44.8% of the patients were less than 45 years. Females were significantly older than males 46.3 ±19.4 years versus 43.9± 19.7 years respectively, $p = 0.011$. There was a male preponderance 52.7% compared to 47.3% females, $\chi^2 7.376$, $p = 0.007$. The average length of hospital stay was 29±23 days (range 1-68days). The males

had a shorter stay (28±23 days) compared with the females (30±23 days) (p value 0.213). More than half of the female patients stayed for at least 3 weeks on admission. Table 1 shows the characteristics of patients on medical admission, the age distribution of the patients and duration of admission by sex. The children under the age of 15 years admitted during

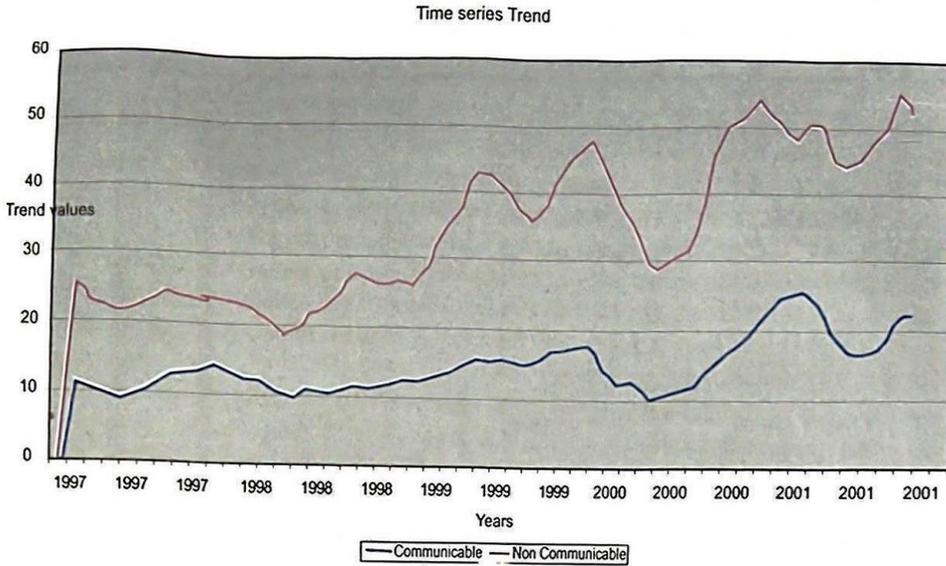


Fig. 2: Trend in communicable and non-communicable diseases admission among medical admissions at Adeoyo State Hospital, Ring-road, Ibadan from 1997 to 2001.

the study period were few (5.1%), while the elderly constituted 20% of the total admissions. Less than half of the patients (45%) were less than 45 years. Of the number of records reviewed, 2471 (95%) had actual age recorded, while the remaining 5% were designated as adults. Male patients consistently predominated in all the age groups except in the active reproductive years, 25 – 34 years and the elderly 65 years and above. Cardiovascular diseases occurred more in the older age groups compared to the infective diseases (Figure1).

Table 2: Current morbidity pattern of medical admissions at the Adeoyo State Hospital compared with findings from previous report.

Disease category	Previously reported (%)*	Current proportion (%)
Cardiovascular	131 (14.4%)	961 (36.8%)
**Infections	216 (23.6%)	780 (24.9%)
HIV	0 (0%)	51 (2%)
Tetanus	72 (7.9%)	162 (6.2%)
Malaria	36 (4%)	42 (1.7%)
TB	15 (1.6%)	33 (1.3%)
Neurological	87 (9.6%)	463 (17.7%)
Gastrointestinal	201 (22.1%)	385 (14.8%)
Endocrine	22 (2.4%)	331 (12.7%)
Respiratory	107 (11.7%)	183 (7.0%)
Genitourinary	44 (3.8%)	85 (3.3%)
Cancers	13 (1.4%)	42 (1.6%)

** Infections such as: HIV, Tetanus, Malaria, TB
*Medical admission to Adeoyo State Hospital, 1969 [7]

Table 3: Some common causes of medical admissions and duration of hospital stay at Adeoyo State Hospital, Ring-road, Ibadan from 1996 – 2001.

Diagnosis	Morbidity Number (%)	Median Length of hospital stay (days)	Mean (sd) Length of hospital stay (days)
CCF	384 (15.3)	17	26 (22)
CVA	282 (11.3)	19	28 (22)
Hypertension	278 (11.1)	20	30 (24)
Diabetes mellitus	297 (11.9)	19	28 (22)
Tetanus	156 (6.2)	19	25 (19)
Meningitis	139 (5.5)	16	22 (20)
Typhoid	92 (3.7)	38	37 (25)
Septicaemia	66 (2.6)	28	30 (23)
HIV	51 (2.0)	33	33 (25)
Liver cancer	25 (1.0)	55	41 (26)

Morbidity

Cardiovascular diseases especially hypertension and hypertension related diseases such as congestive cardiac failure (CCF), cerebrovascular accident (CVA) were the most frequent cause of admissions accounting for 36.8%, followed by infections (24.9%), neurological disorders (17.7%), gastrointestinal disorders (14.8%), endocrine disorders (12.7%), respiratory disorders (7.0%), genito-urinary disorders (3.3%) and cancers (1.6%) Table 2. The findings in the present study shows a slight (1%) increase in the proportion of infectious disease and 150% increase in cardiovascular diseases when

Table 4: Some common causes of mortality among medical admissions at the Adeoyo State Hospital, Ring-road, Ibadan from 1996 – 2001.

Diagnosis	Frequency	Number died	% Proportional Mortality Rate	% Case fatality
CCF	384	49	9.9	12.8
CVA	282	97	19.6	34.4
Hypertension	278	15	3.0	6.8
Diabetes mellitus	297	46	9.3	15.5
Tetanus	156	61	12.3	39.1
Meningitis	139	55	11.1	39.9
Hepatitis	108	19	3.8	17.6
Sepsis	58	15	3.0	25.9
HIV	51	20	4.0	39.2
Primary Liver Cell Carcinoma	25	11	2.2	44.0
Tuberculosis	24	3	0.6	12.5
Other malignancies (lymphoma, leukemia)	13	6	1.2	46.2
Cirrhosis	20	7	1.4	35.0
Malaria fever	42	2	0.4	4.8

Table 5: Comparison of non-communicable (NCD) and communicable diseases (CD), among medical admissions at the Adeoyo State Hospital, Ring-Road, Ibadan from 1996 – 2001.

	Non-communicable diseases (NCD)N =1583	Communicable diseases (CD)N= 916	p value
*Frequency (%)	60.7	35.1	0.000
Mean age (sd)	54.5 (17.0)	34.2 (18.7)	0.000
Duration of admission mean (sd) (days)	29.2 (23.1)	28.5 (22.6)	0.043
Proportional mortality rate (%)	266 (54%)	210 (46%)	0.001
Case specific fatality rate (%)	17	23	0.001

*110 (4.2%) missing data

compared with that from the similar setting carried out over 3 decades ago. In the present study, tetanus was the commonest infection accounting for 6.2% of all admissions, followed by meningitis (5.5%), HIV (2%), typhoid and other diarrhoeal diseases constituted 1.9% and tuberculosis 1.3% of all admissions (Table 3). HIV infection accounted for 2% of all medical admission and the patients stay on admission for about 33days. Mean age of the HIV patients was 36 ± 10 years. Diabetes mellitus accounted for about 95% of all endocrine diseases. Non-communicable diseases (NCD) accounted for 60.7% of all the medical admissions. Duration of admission was 29.2

± 23.1 days for NCDs and 28.5 ± 22.6 days for communicable diseases ($p = 0.043$). (Table 5).

Figure 2 shows increasing trend of non-communicable diseases over the period of study.

Mortality

There were 494 deaths (18.9%) of all admissions, while 1342 (51.4%) were discharged alive. Others were referred out or discharged against medical advice. Table 4 shows the mortality pattern of the various diseases. Cerebrovascular accident (CVA), stroke was the leading cause of death (20%) closely followed by tetanus and meningitis with 12.3 and 11.1% respectively. Congestive cardiac failure (CCF) often secondary to hypertension had 9.9% mortality. HIV accounted for 4% of the total mortality with case fatality rate of 39%. The age specific mortality rate was highest at 65 years of age and above. Proportional mortality rate was higher for non-communicable diseases (54%) compared to communicable diseases (46%) ($p = 0.001$) while case specific fatality rate was higher for communicable disease 23% compared to non-communicable diseases 17% ($p = 0.001$).

Discussion

In this study, the slight preponderance of male patients observed may be due to their better educational level, greater willingness to come to the hospital and ability to afford the cost of treatment. Also there may actually be more males than females in the population.

The fact that more patients were above the age of 45 years and the elderly (65 and above), constituted the largest group on admission in this study contrasts sharply with the previous finding of 72–80% medical patients on admission under the age of 40 years [4,7]. This could mean an improvement in the life expectancy with improved environmental conditions, better standard of living and improved medical services. This may also lend credence to the documentation that Nigeria has moved from being a young population to a mature population [8-10]. Older patients were more affected by cardiovascular diseases in this study suggesting the apparent chronic nature of such diseases. More respondents knew their actual ages when compared with the Ogunmekan study [7]. This could be due to high literacy rates or an improvement in record keeping.

The long duration of hospital stay by the patients could constitute a greater demand on the available resources, human and otherwise. This has economic implications to both the government and family.

Non-communicable diseases accounted for more medical admissions than communicable diseases (CD), the patients required longer hospital stay and recorded higher mortality. This was in keeping with the insidious and chronic nature of the diseases. In Africa, an epidemiological transition has been reported with increasing rates of noncommunicable diseases [12]. The economic burden of these diseases and their demand on the health sector is again highlighted [13-15]. This may be a reflection of the changing pattern of diseases. As previously observed, age was also positively associated with occurrence cardiovascular diseases in this study [16]. The increasing prevalence of cardiovascular disease could be said to be in keeping with the prediction of Falase *et al* [17] also NCDs including cardiovascular diseases, mental illness, cancer and diabetes are now known as major sources of morbidity and mortality projected to overtake infectious diseases by 2030 [18]. Various risk factors for cardiovascular diseases have been reported to be prevalent in Africans of recent [19]. These include lifestyle and dietary habits changing towards western pattern. Cerebrovascular accident, the leading cause of death in this study is consistent with previous reports [5,6,20-24] Cerebrovascular accidents and congestive cardiac failure as the leading cause of mortality shows the need for more intensive effort at primary prevention of hypertension, community education and primary health care [25,26]. These should include community screening for early detection of hypertension and appropriate management of the disease.

Infections though not the commonest cause of admission in this study were still important. Tetanus was the commonest infection responsible for medical admission; tetanus case fatality rate was still rather high in this study even though it has reduced from 58% previously reported to 39% in this study. A higher case fatality of 72.7% has been reported in a series between 1999 and 2001 [27]. Thus there may be a need to review the patient case management and preferably the immunization delivery system and its acceptance by mothers. This is supported by the fact that meningitis was much more frequently reported in this study (5.5%) compared to the Ogunmekan study (3%). This calls for increase effort in the immunization against meningitis to reduce the increasing burden of this disease. The lower frequency of typhoid fever and other diarrhea diseases 2% in this series compared to 5% in the previous report may be attributed to the practice of the frequent diagnosed and treatment by general practitioner in private hospitals, which are now widespread. An improvement in the living conditions, environmental sanitation may also contribute to the decline in the diarrhea diseases. However *HIV* infection that did not feature in previous reports accounted for 2% of admissions in this survey. This will however not be a true reflection of the prevalence of the disease that is about 5%, because *HIV* still carries a stigma and the patients are usually not admitted into the wards except for an emergency. Patients also do not present at health facility but seek traditional forms of care. There is a need for a well-equipped centre designated for the management of these patients to help improve the outcome of the disease. The importance of reinforcing the universal precaution even at general hospitals is highlighted. This underscores the need for special centres.

The overall mortality rate of 18.9% in this series is similar to 19% described by Lauckner for the studies in UCH [4] and a little lower than the 21.4% previously reported by Ogunmekan in 1973 at Adeoyo Hospital [7]. Ogun *et al* [6] in their study carried out in a tertiary institution reported a mortality rate of 25%. This high mortality rates may be due to late stage disease presentation of patients into the hospitals. The trend of admission was such that there was a steady rise in the number of patients in successive years. This could mean that there is an increase in acceptability of orthodox medicine or an improvement in services offered at the health facility. It could also be a reflection of an increase in population. Also, the government due to political reasons could have subsidized the cost of health care affording more people the opportunity of care. The general reduction in patient turn out in December may

be due to the wish of the people to stay at home at the end of the year rather than be in the hospital during a period of festivity.

Conclusion

A pragmatic approach is required by health policy makers to curb the imminent epidemic of NCDs particularly cardiovascular diseases top of which is hypertension and related diseases. The need for life style modification to prevent non-communicable diseases and drug compliance for patients with non-communicable diseases should be emphasized (Olubodun *et al*,1990) [28]. There is a need for an extensive population awareness and screening program, health education with early detection and treatment. A cardiovascular institute that will cater for the increasing cardiovascular diseases is suggested. This will also afford the establishment of prospective cohort studies which have been advocated for non-communicable diseases in sub-Saharan Africa in view of the large and growing burden of NCDs [29]. Patients with stroke should be managed at specialized health care facility with intensive care to minimize morbidity and mortality associated with stroke. Immunization should be promoted to reduce the morbidity and mortality due to infectious conditions. Immunization programme should be reviewed; a wider coverage that will include adults should be put in place. It is also recommended that quarterly or yearly review, analysis and presentation of patients' admission records be done in the secondary health facility to ensure up to date information and guide health care planning. This will also contribute towards good record keeping in the health facility. This can serve as an audit of medical care and help to evaluate services in the hospital.

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