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CHARACTERISATION OF MATERNAL MORTALITY IN COLOMBIAN INDIGENOUS COMMUNITIES, 2011 TO 2013. STUDY OF CASES BASED ON SENTINEL SURVEILLANCE

Caracterización de la mortalidad materna en comunidades indígenas Colombianas, 2011 a 2013. Estudio de los registros de vigilancia epidemiológica de casos centinela

Laura Margarita Bello-Álvarez, MD¹; Arturo José Parada-Baños, MD, MSc²

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ABSTRACT

Objective: To characterise the behaviour of maternal mortality (MM) in Colombian indigenous populations during the triennium 2011-2013.

Materials and methods: Study based on epidemiological surveillance of maternal mortality cases. The study population included all maternal deaths, direct and indirect, and live births reported in the indigenous population in the country. Cases of mortality coinciding with pregnancy, such as deaths due to injuries from external causes, accidental and incidental causes, were excluded. The search of MM sentinel cases was made in the databases of the National Public Health Surveillance System (SIVIGILA) from the National Health Institute (INS),

and registries of births and deaths of the National Administrative Statistics Department (DANE) for the time period between 2011 and 2013. Sociodemographic variables, maternal and childbirth care variables, geographical area and place of death, and grouped and specific causes of maternal death were measured. A descriptive analysis of the information was carried out using absolute and relative frequency measurements for the data.

Results: In Colombia, 1546 cases of deaths in pregnant women were reported during the triennium 2011-2013, of which 143 cases of MM were analysed in indigenous communities: 130 met the inclusion criteria and 13 were excluded due to incidental or accidental causes. The maternal mortality ratio (MMR) for this population was 327.5 per 100,000 live births during the triennium, while in the non-indigenous population it was 60.9. Of maternal deaths in indigenous population, 22.3% were in girls under 19 years of age and 29.2% in women over 35 years of age. The main causes of MM were postpartum haemorrhage, eclampsia and puerperal sepsis.

1 Physician with focus on Public Health, Universidad de La Sabana; MSc(e) Public Health, University of London – London School of Hygiene and Tropical Medicine; Obstetrician and Gynaecologist, Universidad Nacional de Colombia, Cali (Colombia). lbelloa@unal.edu.co

2 Obstetrician and Gynaecologist, Universidad Nacional de Colombia. Associate Professor, Obstetrics and Gynaecology Department, Medical School, Universidad Nacional de Colombia, Bogotá (Colombia). ajparadab@unal.edu.co

Conclusion: In indigenous communities, maternal mortality is five times greater than in the non-indigenous population of the country. Multi-sectorial interventions that take into consideration the cultures of these peoples are needed in order to reduce inequities that affect them.

Key words: Maternal mortality, indigenous population, eclampsia, postpartum haemorrhage, puerperal infection.

RESUMEN

Objetivo: caracterizar la población que presentó mortalidad materna (MM) en las poblaciones indígenas colombianas durante el trienio 2011-2013.

Materiales y métodos: se realizó un estudio con los registros de vigilancia epidemiológica de casos de mortalidad materna. La población de estudio incluyó todas las muertes maternas, directas e indirectas, y los nacidos vivos, reportadas en la población de la etnia indígena en el país; se excluyeron los casos de mortalidad coincidente con el embarazo, como las muertes por lesiones de causa externa, causas accidentales e incidentales. Se realizó la búsqueda de los casos de MM en las bases de datos del Sistema Nacional de Vigilancia en Salud Pública (SIVIGILA) del Instituto Nacional de Salud (INS), y los registros de nacimientos y defunciones del Departamento Administrativo Nacional de Estadística (DANE) de los años 2011 a 2013. Se midieron variables sociodemográficas, maternas y de la atención del parto, área y lugar de defunción, y causas agrupadas y específicas de la muerte materna. Se realizó un análisis descriptivo de la información utilizando medidas de frecuencia absoluta y relativa para los datos.

Resultados: en Colombia se presentaron 1.546 casos de muertes en mujeres embarazadas durante el trienio 2011-2013, de estos se analizaron 143 casos de MM en comunidades indígenas: 130 cumplieron los criterios de inclusión y 13 se excluyeron por causas incidentales o accidentales. La razón de mortalidad materna (RMM) para esta población fue 327,5 por 100.000 nacidos vivos durante el

trienio, mientras que en la población no indígena fue de 60,9. El 22,3 % de las muertes maternas en indígenas fue en menores de 19 años, y el 29,2 % en mayores de 35 años. Las principales causas de MM fueron hemorragia posparto, eclampsia y sepsis puerperal.

Conclusión: en las comunidades indígenas existe una mortalidad materna cinco veces mayor a la de la población no indígena del país. Se requieren intervenciones multisectoriales que tengan en cuenta la cultura de estos pueblos para reducir la inequidad que los afecta.

Palabras clave: mortalidad materna, comunidades indígenas, eclampsia, hemorragia posparto, infección puerperal.

INTRODUCTION

Maternal death is defined by the World Health Organisation (WHO) as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to, or aggravated by, the pregnancy or its management, but not from accidental or incidental causes (1). Maternal mortality (MM) is an indicator of a country's health situation and is a quality tracer event in healthcare services (2). In view of the fact that maternal health is associated with socioeconomic conditions, environmental sanitation and education (3), it has been considered as an indicator of socioeconomic, gender and ethnic inequalities (4).

In the world, descriptions from the ethnic standpoint show that health indicators among indigenous populations are very poor as a result of poverty, malnutrition, environmental contamination and prevalent infections (3). In América, indigenous peoples are among the groups affected by the highest inequalities and inequities in reproductive and maternal health as a result of social and economic exclusion (5). In Colombia, according to the National Health Observatory, 24% of all maternal deaths happen in indigenous and Afro-Colombian populations, 68% in the poorest quintiles according

to the Sisben surveys, and 30% among women with the lowest levels of schooling (6).

Although indigenous communities in Colombia represent close to 3.4% of the country's total population, in 2013 this population contributed 13.7% of maternal mortality cases, and the maternal mortality ratio in indigenous/non-indigenous population was 7:1 (7, 8). It is important to characterise maternal mortality under a differential approach designed specifically for minority ethnic communities in order to identify the performance of this indicator relative to previous measurements, determine the priorities for specific interventions in indigenous populations in order to reduce inequities and, finally, impact the country's MM indicators. Therefore, the objective of this work is to describe the characteristics of the incident cases of MM in the indigenous populations between 2011 and 2013 in Colombia.

MATERIALS AND METHODS

Incident cases of maternal mortality were studied. All direct and indirect maternal deaths reported in indigenous women between January 1, 2011 and December 31, 2013 were included, as well as all registered births from indigenous women in the country during the same time period. Deaths coincident with pregnancy such as injuries from external causes, both accidental and incidental, were excluded. Consecutive sampling was performed.

Procedure. The cases of maternal deaths were identified in the database of birth and death records of the National Statistics Department (DANE). The data bases of the National Public Health Surveillance System (SIVIGILA), of the National Health Institute (identified as event 550 - maternal mortality) for the years 2011-2013 were also queried. Live birth data for this population was obtained from the DANE birth records for the same time period. The databases were rendered anonymous by DANE and the National Health Institute (INS) before delivery to the researchers. Both the DANE as well as the SIVIGILA databases include the ethnic variable and, under it, the records for the indigenous population.

Measurements included sociodemographic variables such as age, education, marital status, cohabitation, social security, area of residence and occupation; clinical and care variables such as parity, number of prenatal visits, gestational age, delivery route, place of childbirth care, person attending the birth, and place of death; grouped and specific causes of maternal death, including bleeding complications, hypertensive disorders of pregnancy, infectious, oncologic and other causes; and variables such as verbal autopsy or necropsy for the cause of death, and delays associated with maternal death.

A database was built in Microsoft Excel 2013 ®, and then analysed using the STATA v12.1® software package. Absolute and relative frequencies were used for descriptive data; continuous variables are presented in means and ranges. Results are shown in tables and graphs. The maternal mortality ratio is presented by year, by maternal age and by grouped or specific cause of death. Maternal mortality was also estimated in the non-indigenous population for comparison during the time period described.

Ethical considerations. The research protocol was submitted to the Ethics Committee of Universidad Nacional de Colombia and to the Intellectual Property Committee of the National Health Institute, and was approved by both agencies. Confidentiality of the information about the study subjects was guaranteed.

RESULTS

A total of 1,546 cases of maternal mortality for the whole country were identified during the study period in the DANE birth and death registry. Of those, 143 (9.2%) happened in indigenous women, of which 130 cases (91%) were included in the study (Figure 1). During the same period, there were 2,001,169 live births in Colombia, of which 39,695 (1.9%) were to women of indigenous ethnic origin. The maternal mortality ratio (MMR) for the three-year period between 2011-2013 in the indigenous population was $327.5 \times 100,000$ live

births. Table 1 shows the distribution of the MMR per year. Data regarding the cause of death were obtained from clinical necropsy in 8% of the cases; data in the clinical record to determine the cause of death were obtained in 69%, and in 23%, data were obtained from the verbal autopsy.

Sociodemographic, clinical and care characteristics: The median age of the women who died during the three-year period was 28 years, with a range between 11 and 49 years. Maternal deaths occurred mainly in women with a low level of schooling, affiliated to the state-subsidised health regime, living in the rural areas, and whose occupation was house work (Table 2). The indigenous women who died during the three-year period had a median of 2 children (range 0-12 children per woman); 31.6% had given birth 5 or more times; 62% had not attended any prenatal visits; and 13.8% had attended more than 4 prenatal visits. In the group that attended prenatal care, the median gestational age was 18 weeks, with a range between 4 and 39 weeks. Of the documented deliveries, 30.9% were

attended by midwives. Overall, 29% of the women died before childbirth, 5% died during childbirth, 28% died in the immediate postpartum period, and the remaining 38%, died later in the mid and late postpartum period. Of the pregnant women who died, 74% received care in a health institution, 41% in primary level, 35% in secondary level and 24% in tertiary level institutions; 69% died in the urban township and 68% in a hospital (Table 2).

Maternal deaths in women under 19 and over 35 account for 51.5% of maternal mortality among indigenous women. MMR in these age groups can be up to 120 times higher than the MMR for the non-indigenous population (Table 3). The geographic department with the highest number of maternal deaths among indigenous women is Guajira, followed by Cauca and Chocó. Likewise, these departments refer the highest number of pregnant women who die in other departments (Figure 2). However, together, the departments of Atlántico, Magdalena, Caquetá, Cundinamarca and Boyacá have the highest maternal mortality ratios in

Figure 1.
Distribution of maternal deaths among indigenous and non-indigenous.
Triennium 2011-2013

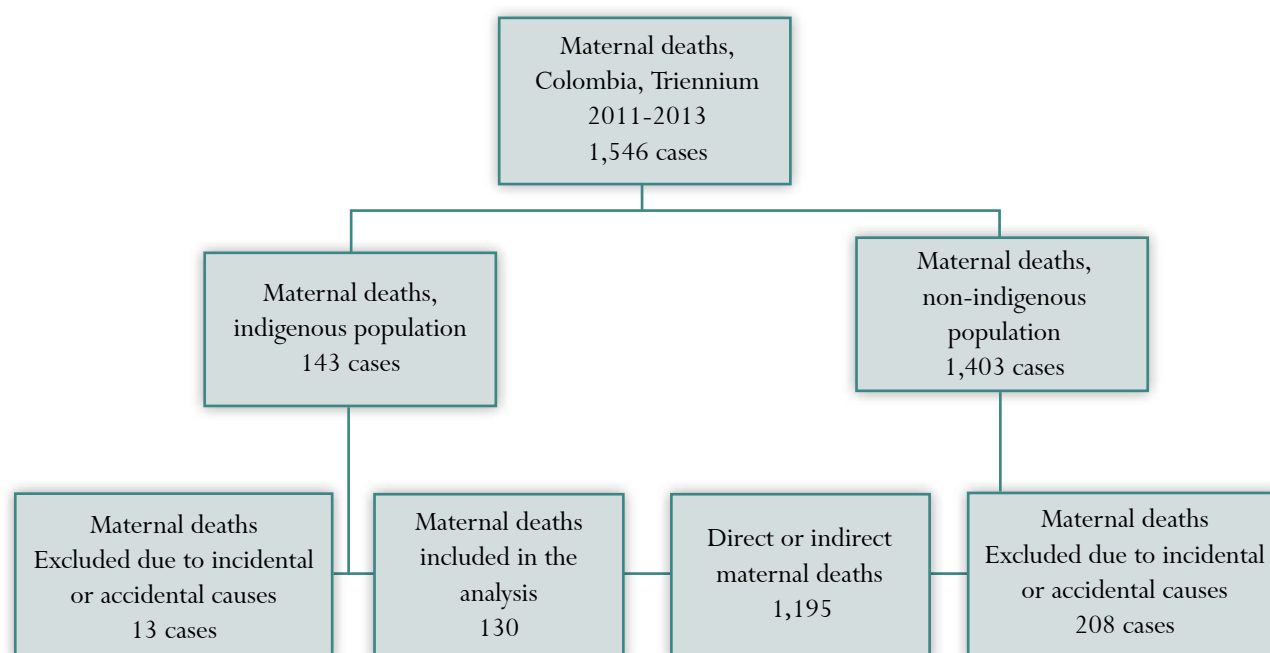


Table 1.
Maternal mortality in indigenous and non-indigenous populations, Colombia, 2011-2013

Year	Indigenous population		General population (non-indigenous)		Indigenous MMR/ non-indigenous MMR
	Number of maternal deaths	Maternal mortality ratio	No. Maternal deaths	Maternal mortality ratio	
2011	44	338.4	430	65.9	5.1
2012	33	238.6	432	65.2	3.7
2013	53	362.5	333	51.7	7

Source: Vital statistics, DANE, 2011-2013.

their indigenous communities, higher than 1,000 for every 100,000 live births in all cases (Figure 3).

The following were the causes of maternal deaths among indigenous women: bleeding complications during pregnancy, childbirth or the postpartum period (29.2%); gestational hypertensive disorders (28.5%); sepsis of obstetric origin (14.6%); sepsis of non-obstetric origin (5.4%); oncologic causes (4.6%); others (17.7%). The main cause of death due to bleeding complications was postpartum bleeding (78.4%); eclampsia was the main cause among hypertensive disorders (55.5%); postpartum sepsis was the main cause among obstetric infections (63.2%); and pneumonia was the main cause among non-obstetric complications (37.5%).

The three main causes of MM in the indigenous population are the same as among the general population in Colombia. However, the MMR for each specific aetiology is higher among indigenous women than in the general population (Table 4).

DISCUSSION

This study shows that, in 2013, the MMR among the indigenous population was five times higher than in the overall non-indigenous population, and was higher in women under 19 and over 35 years of age with significant parity. It was also found that prenatal care coverage is less than 35%, more than 50%

of the women receive care initially from midwives, and up to 25% never reach a healthcare institution. Likewise, postpartum bleeding and obstetric sepsis were found to have a much higher impact than in the non-indigenous population. All these findings reflect avoidable and inequitable outcomes among indigenous women when compared to the situation of other pregnant women. Indeed, these findings reflect the inequities (9) that indigenous peoples have to bear in Colombia.

Inequity in terms of MMR in Colombia is higher than the one observed in Mexico, where women of indigenous origin have a risk 2-3 times as high as that of non-indigenous women (10), and also higher than the one reported in the state of Guerrero, where MM among indigenous women is 6 times as high as that of the rest of the country (11). The MMR reported by us for the triennium (324 x 100,000) is lower than the one reported in the rural areas inhabited by indigenous people in Panama, where it may be as high as 658 x 100,000 (12); and it is similar to the one reported in the vastly indigenous region of Puno in Peru, of 350 x 100,000 (13).

The results of our study regarding the reproductive behaviour of the deceased women could be explained on the basis of a poor perception of the risk associated with pregnancy in extreme gesta-

Table 2.
Sociodemographic characteristics of maternal deaths among women of indigenous ethnic origin, Colombia, 2011-2013

Variable	N = 130	%	Variable	N = 130	%
Age (years)			Social security		
< 15 years	6	4.6	Subsidised	109	83.8
15-19 years	23	17.7	Contributive	3	2.3
20-35 years	62	47.7	Special	1	0.8
36-45 years	35	26.9	Not covered	13	10
> 45 years	3	2.3	No data	4	3.1
No data	1	0.8	Area of residence		
Schooling			Scattered rural	90	69.2
Basic primary	50	38.5	Township	24	18.5
Basic secondary	9	6.9	Populated centre	14	10.8
Middle Academic	4	3.1	No data	2	1.5
Middle technical	2	1.5	Occupation		
None	33	25.4	Housewives	67	51.5
No data	32	24.6	Farmers	5	3.8
Marital status			Students	4	3.1
Free union	72	55.4	Cooks	3	2.3
Married	16	12.3	Domestic employees	3	2.3
Single	23	17.7	Artisans	2	1.5
Widow	1	0.8	Others	10	7.8
Separated	1	0.8	No data	36	27.7
No data	17	13.1	Parity (No. of childbirths)		
Cohabitation			Primíparous (1)	32	24.6
Spouse	72	62.1	Múltiparous (2 ti 4)	52	40.0
Family	51	23.5	Great multiparous (5 to 9)	33	25.4
Alone	6	13.7	Great - great multiparous (10 or mor)	8	6.2
Sin dato	1	0.7	No data	5	3.8
Area of death			Number of prenatal visits		
Township	90	69.2	Between 1 and 4	31	23.8
Scattered rural	34	26.2	More than 4	18	13.8
Populated centre	6	4.6	None	81	62.4
Place of death			Person attending vaginal delivery		
Hospital	88	67.7	Midwife	17	30.9
Home	26	20.0	General practitioner	15	27.3
Health centre	1	0.8	Obstetrician	9	16.4
Street	5	3.8	Licensed practical nurse	1	1.8
Other place	7	5.4	Other (alone, relative, no data)	13	23.6
No data	3	2.3	Total	55	100

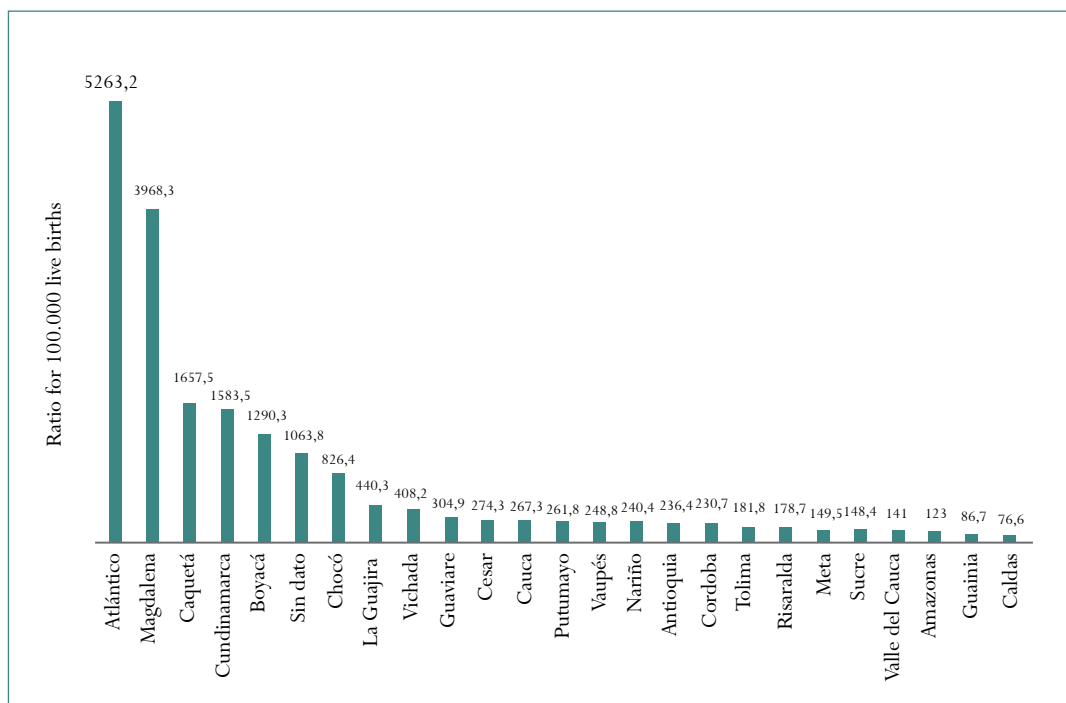
Source: Vital statistics, DANE, 2011-2013. SIVIGILA, Event 550. INS, 2011-2013.

Figure 2.
Distribution of maternal deaths in women of indigenous ethnic origin,
by geographic department of residence. Colombia, 2011-2013



Source: Vital Statistics, DANE, 2011-2013.

Figure 3.
Maternal mortality ration in indigenous women by geographic department, 2011-2013



Source: Vital Statistics, DANE, 2011-2013

Table 3.
Maternal mortality ratio in indigenous women,
by age group. Colombia, 2011-2013

Age group	No.	%	MMR
< 15 yers	6	4,6	847,5
15 -19 yers	23	17,7	229,2
20-35 yers	62	47,7	244,6
36-45 yers	35	26,9	873,5
> 45 yers	3	2,3	336,3

Source: Vital Statistics, DANE, 2011-2013.

tional ages, low attendance to prenatal visits, great multiparity, and childbirth attended by midwives (14, 15).

Low initial hospital care of pregnant women from indigenous ethnic background and the high percentage of vaginal deliveries attended by midwives or people other than healthcare staff (55%) point to inequity in these communities when compared to the national average of 98.7% of the women with access to childbirth in the hands of qualified staff, and 98.6% who deliver in a health-care institution (16).

Table 4.
Main causes of maternal mortality in Colombian women. Comparison between
indigenous women and the general non-indigenous population, 2011-2013

Indigenous population			Non-indigenous population		
Grouped causes	%	MMR	Grouped causes	%	MMR
Bleeding complications	29.2	91.6	Bleeding complications	22.5	13.9
Pregnancy-related hypertensive disorders	28.5	89.2	Pregnancy-related hypertensive disorders	19.4	12.0
Sepsis of obstetric origin	14.6	45.8	Sepsis of obstetric origin	9.0	5.6
Non-obstetric sepsis	5.4	16.9	Non-obstetric sepsis	12.5	7.7
Oncologic causes	4.6	14.5	Oncologic causes	6.5	4.0
Tuberculosis	3.1	9.6	Tuberculosis	0.9	0.6
Heart diseases	1.5	4.8	Heart diseases	2.0	1.2
Tropical diseases	1.5	4.8	Cerebrovascular disease	2.3	1.4
Thromboembolic events	1.5	4.8	Thromboembolic events	6.2	3.8
Cardiovascular disease	0.8	2.4	Cardiovascular disease	1.7	1.0
Autoimmune diseases	0.8	2.4	Autoimmune diseases	2.7	1.7
HIV	HIV	2.4	VIH	1.5	0.9
Unspecified causes	8.5	26.5	Unspecified causes	8.1	5.0

Source: Vital statistics, DANE, 2011-2013. SIVIGILA, Evento 550. INS, 2011-2013.

Although the three main causes of MM in Colombian indigenous women found in this study are the same that have been found by the WHO (17) in the general population worldwide, in Colombia (3, 5, 16), and in other indigenous communities in Latin America (11, 14), namely, bleeding, hypertensive disorders and sepsis, the impact of bleeding and infection is noteworthy. These are conditions for which there is sufficient knowledge of safe and effective interventions for prevention and treatment, hence the conclusion that many of these deaths are preventable.

Factors inherent to the indigenous communities must be taken into consideration, in order to plan interventions that are respectful of cultural differences and can actually have a positive impact on reproductive and maternal health. These factors include their cosmovision or set of beliefs, customs, values and practices, as well as their relationship with the environment and their spiritual beings, their dependence on traditional and western health-care services, and access to obstetric emergency care (10, 11).

Study limitations. Some of the data have limitations considering that 23% of the maternal mortality cases were derived from the verbal autopsy. MM could not be analysed under the model of 4 delays, given recording deficiencies in relation to maternal mortality in the indigenous communities in the SIVIGILA system.

CONCLUSIONS

Maternal mortality in indigenous communities is five times higher than among non-indigenous populations in the country. The multiplicity of factors that contribute to maternal mortality and their specific relation to each ethnic group must serve as an incentive to undertake studies aimed at gaining greater knowledge about each population. This would result in a differential approach designed to reduce maternal mortality in these minority populations. The inequities afflicting these peoples should be addressed by means of multi-sectorial

interventions that consider the cultures of the various indigenous peoples.

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