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Articles

Special Issues

Journal Subscription

Downloads

PubMed Indexed Article

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Inadequate Lifestyle and Diet Quality in Pregnant Women at the Mother and Child Hospital in Cotonou, Benin

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Inadequate Lifestyle and Diet Quality in Pregnant Women at the Mother and Child Hospital in Cotonou, Benin

Azandjeme Colette Sylvie[1]*, Sossa Jerome Charles[1], Saizonou Jacques[2], Alihonou Florence[3], Houndegla Nicole[3], Mizehoun Carmelle[3] and Agueh Victoire[1]

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Abstract

Background: Diet of pregnant women is a major challenge because fetal development and resulting obstetric depend on the nutritional status of pregnant women. This study aims to describe the diet quality and lifestyle of pregnant women.

Method: This descriptive and analytical cross-sectional study involved 305 pregnant from the 2nd quarter, identified by the convenience of 29 September to 26 October 2015 at CHU-MEL in Cotonou. Nutritional status was assessed by measuring arm circumference. Eating habits and diet quality of pregnant were assessed using the food frequency questionnaire and 24-hour dietary recall. Lifestyle, including physical activity, consumption of alcohol and tobacco was appreciated using a questionnaire.

Results: The diet of pregnant women is characterized by a lack of daily consumption of fruits (35.4%), vegetables (7.2%), leafy green vegetables (10.2%), meat (4.3%), poultry (5.6%) and legumes (1.6%). However, high consumption of cereals (87.2%), fats (96.4%) and fish (75.1%) were observed. Frequent consumption of non-food substances such as clay and cola were observed respectively in 10.5% and 6.6% pregnant. Energy protein intakes are lower than the nutritional recommendations for pregnant women 15.4% while intakes of carbohydrates and fats are higher respectively for 54.1% and 8.9% pregnant. Energy intake for all three macronutrients is inadequate for 80.3% of pregnant. The prevalence of physical inactivity is 72.8%. No pregnant women use tobacco, while 9.8% of pregnant consume alcohol and 17.7% of coffee.

Conclusion: It appears from this study that diet quality is not adequate for most pregnant., providing inadequate micronutrient and micronutrients intake. Actions aiming to nutritional education of pregnant women need to be set in this hospital. Before that, it's needed to explore the knowledge level, motivation and implication of health care staff in such activities.

Keywords: *Diet; Lifestyle; Nutritional Status; Pregnant; Hospital; Benin*

Abbreviations

WHO: World Health Organization; UNICEF: United National of International Children's Emergency; UNFPA: United Nations Fund for Population Activities; DHS: Demographic Health Survey; MICS: Multiple Indicator Cluster Survey; INSANE: Institut National de Statistique Appliquée et d'Economie (National Institute of Statistics and Economic Analysis); EMICoV: Enquête Modulaire Intégrée sur les Conditions de Vie (Integrated Modular Survey on Household Living Conditions)

Introduction

The health of the child's mother occupies a place of choice in the objectives of lasting development because the death rate kindergarten is again very elevated in the countries in development, notably those of Africa to the south of the Sahara. Indeed, whereas the death rate kindergarten is off in the European countries and Americans, it is off in the African countries. In Benin, according to the data of the DSH

III, the death rate kindergarten is of 397 women for 100.000 living births some 2006. The ratio of intra-hospitable mortality is of 152.3 for 100.000 living births. The Group inter-agencies to the world level (WHO, UNICEF, UNFPA), situate Benin to 350 maternal deaths for 100 000 living births some 2013 [1]. Since 2001, one doesn't note an important change in the prenatal follow-up, the proportion of women having received some care prenatal having passed from 87% in 2001 to 88% in 2006 and to 86% in 2011 - 2012.

Among maternal mortality determinants, anemia and stern infections count for 14%, diabetes and heart diseases count for 25% while other causes are hemorrhage (25%), dystocia (10%), complications of hypertension on pregnancy (13%) and abortion complications (13%).

The nutritional status of a pregnant woman is an important challenge of health maternal and infantile bus of the mother's nutritional health depends on the descended of pregnancy and the ulterior development of the offspring. The nutritional problems the more often met in the African countries at the pregnant women are the undernutrition and the defaulting in micronutrients as anemia, the deficiency in vitamin A and the goiter. The prevalence of anemia decreased from 64% to 41.4% according to the EDS 2001 and 2011 [2,3].

The woman's nutritional profile in age to procreate knew an improvement for what concerns the chronic energizing deficit. Of 15% in 1996, this prevalence is off 6.2% in some 2011. On the other hand, the prevalence of overweight and obesity increased passer-by 9% to 28.8% during the same period. The most elevated prevalence was observed in the department of the Coastline that is the city of Cotonou (40%). In a global way, the ponderal overcharge was two times more elevated in an urban environment in a farming environment. The prevalence of obesity and diabetes at the women are respectively of 30.2% and 4.5% [4].

At the women having delivered in the five years preceding the EDS 2006, the prevalence of the nocturnal blindness was 2% [5]. It remained globally steady at the woman enclosed between 2001 and 2006, with all the same, a very slight tendency to the rise in farming environment.

For what concerns the deficiency made of zinc, Benin is classified as a country at middle risk. National data don't exist on the prevalence of the deficiency in calcium, folic acid and B12 vitamin. However, the prevalence raised of the effects indirect of the deficiency in these nutrients (delay of growth intra-uterine, weak weight of birth, eclampsia), permits to conclude to the existence of the deficiency in these micronutrients.

The prevalence of the weak weight of birth is on the increase consequently little at the nutritional status gleaming of the women in age to procreate and of pregnant. Of 7% in 1996, it passed to 13% in 2006 then maintained without change until 2011 according to the EDS and in 2014 (MICS) around 12.5% [6]. The prevalence of the growth (chronic malnutrition) delay is also on the increase from 1996 (25%) to 2006 (38%) according to the demographic investigations of health. In 2018, 32% of the children of 6 to 59 months endured delay of growth of which 8.5% under the stern shape.

To Benin, 12% of the households are in food insecurity and 13.2% are to food insecurity risk. However, the mother's food during pregnancy is therefore determining for the health of the couple mother child in order to reverse these tendencies. It is essential to bring to the organism the necessary nutriments to its needs and to assure the harmonious growth of pregnancy as well as a happy exit.

However very few data exist on the food of the pregnant women and it does not exist to our Beninese survey knowledge having carried on the food of the pregnant women. We emitted the hypothesis that the food of the pregnant women that comes in consultation the CHU-MEL is inadequate and affected their nutritional state.

Aim of the Study

The present survey aims therefore to assess the relationship between quality of diet, lifestyle and nutritional status of pregnant women attending the CHU-MEL.

Materials and Methods

This a descriptive and analytic transverse survey was about 305 pregnant identified by convenience of September 29 to October 26, 2015 among the set of the external gestates come in prenatal consultation in the hospitable and academic center of the mother and the child Lagoon of Cotonou (CHU-MEL).

The nutritional status has been appreciated by the measure of the brachial perimeter. The undernutrition or chronic malnutrition has been detected for a tour of arm lower to 180 mm reflects; a value between 180 - 210 mm is moderate malnutrition and a value superior to 210 mm is considered normal. The arterial pressure has been considered elevated for a value superior to 130/90 mmHg. The lifestyle is appreciated for the physical activity level, the consumption of alcohol and tobacco. The physical activity level has been measured with a questionnaire and has been classified in sedentary, little active, and active whereas only the consumption or no of alcohol and tobacco have been considered.

The detection biochemical of some nutriments and biologic scorers also permitted to appreciate the nutritional state and to detect the nutritional problems.

Let us specify that the blood dosages have not been made that investigated for the $1/10^{th}$ of the population, either 305 pregnant women. This balance is composed of the blood count, the blood sugar on an empty stomach, the magnesia, the calcemic, the ferritinemia and the albuminuria.

The quality of the food has been appreciated thanks to the questionnaire of consumption frequency and recall of 24h. The consumption one to several times per day, several times per week and several times per month and once per month food usually consumed in south Benin has been determined. The consumption is considered daily for the consumptions of one to several times per day, frequent when it is from one to several times per day or several times per week and it is rare if it is of several times per month or of once per month.

A recall of 24h permitted to determine the total energizing contributions as well as the energizing contributions for each of the macronutrients with the help of the software Alimentheque version 3.5.20. The adequacy of WHO recommendations for macronutrient intake was used (45 - 65% for the carbohydrate, 15 - 20% for proteins and 25 - 35% for fats).

The data analyzed with Statistical Package heart Social Sciences (SPSS) version 20.0 and Alimentheque Softwares. Confidentiality, anonymous and participants consent were required in data collection and analysis.

Results

Characteristics of pregnant women

The major part (54.42%) of the studied population has an age understood between 26 and 35 years, 35.75% of the sample have 25 years or less; 38.70% of the pregnant have a secondary survey level and 26.20% are academic. With regard to the profession, 29.5% of the pregnant are the civil servants and 29.2% of the storekeepers. As for their spouses, 49.2% are the civil servants and 37.4% of the craftsmen and workers.

Lifestyle

The prevalence of the physical inactivity is of 72.8%, 23.3% are little active and only 3.3% have a good physical activity practice level; 9.8% of the pregnant woman consume the alcohol, 17.7% of coffee and no doesn't consume tobacco.

Nutritional status

Digestive troubles were constipation (31.1%), nausea and vomiting (20.3%) and gastric burns (28.9%). Food allergies and food interdiction were observed respectively in 7.7%, and 20.3% pregnant Concerning signs denoting nutritional problems, 1.3% of pregnant have shown paleness of the mucous membranes and 1.3% mouth wounds, sign of vitamin A deficiency. The presence of stain of Bitot, labial chelate and goiter has not been observed in pregnant women. Only 1% of them have undernutrition and 6.9% presented blood hypertension. Considering service rates of nutrients and biologic marquees of the nutritional status, it was noted that 43.3% of pregnant have anemia. The mean volume globular of blood shows that 16.7% of pregnant women have red blood cell microcytosis whereas 16.6% have macrocytosis.

The mean globular concentration in hemoglobin (TGMH) and the mean corpuscular concentration in hemoglobin (CCMH), were normal for all pregnant. The depletion of iron reserves expressed by the low ferritin rate was observed in 60% of pregnant, low serum albumin in 43.3 and low serum calcium in10%. High blood glucose, gestational diabetes-like was observed in 17.2% of pregnant.

Diet quality

The food is characterized by a frequent consumption by the majority of pregnant women of cereals (99%), roots and tubers (78.7%) fat (98.7%), fruits (88.2%), vegetables (72.8%) and fish (97.7%). Even frequent, the daily consumption of fruits and vegetables is weak, 7.2% for vegetables, 10.2% for leafy green vegetables and 35.4% for fruits. The consumption of meats (37.4%), poultries (52.5%), eggs (58.0%), legumes (32.1%), oilseeds (20%) and dairy products (64.9%), fast foods of western type (5.9%) are less frequent. The consumption of the following food was rare in the majority of the pregnant, alcoholic drinks is rare (91.5%), sodas (62.0%) sugary food (55.7%). The consumption of non-food substances as the cola and the clay "calaba" is respectively frequent at 6.6% and 10.5% of pregnant.

The most of pregnant (87.2%) consumes food supplements, as Iron and the Folic acid (83.58%) whereas 16.42% added calcium (9.4%), magnesium (3.8%) and multivitamins (2.2%). The total energy contributions are raised for 57.1% of pregnant women. Whereas the energy contributions for the set of the three macronutrients are inadequate for the majority of pregnant woman (80.3%), the energy input from proteins were low in 15.4% of pregnant and input in carbohydrate and fats were high for respectively 54.1% and of 8.9% of pregnant women.

Food/Groups of food	Daily Consumption		Frequent consumption		Rare consumption	
	N	%	n	%	N	%
Beans	5	1.6	98	32.1	207	67.9
Peanut	8	2.6	61	20.0	244	80.0
Poultry	17	5.6	160	52.5	145	47.5
Meat	13	4.3	114	37.4	191	62.6
Fish	229	75.1	298	97.7	7	2.3
Eggs	34	11.1	177	58.0	128	42.0
Dairy products	46	15.1	198	64.9	106	34.8
Gluey leaf	29	9.5	220	72.1	85	27.9
Green leaf	31	10.2	222	72.8	83	27.2
Gumbo	14	4.6	78	25.6	227	74.4
Vegetables	22	7.2	138	45.2	167	54.8
Fruits	108	35.4	269	88.2	36	11.8
Cereals	266	87.2	302	99.0	3	1.0
Root and tubers	58	19.1	240	78.7	64	21.0
Fat matters	294	96.4	301	98.7	4	1.3
Fast food	7	2.3	18	5.9	287	94.1
Sodas	13	4.3	116	38.0	189	62.0
Alcoholic drinks	2	0.7	26	8.5	279	91.5
Sugar added	51	16.8	205	67.2	99	32.5
Sugary food	31	10.2	135	44.3	170	55.7
Clay	11	3.6	32	10.5	273	89.5
Cola	10	3.3	20	6.6	285	93.4

Table 1: *Distribution of the pregnant according to their food frequency consumption. Daily consumption: 1 to several times per day; Frequent consumption = several times per week; Rare consumption = 1 to several times per month.*

	N	%
Total energy contribution		
Low	44	14.4
Normal	87	28.5
High	174	57.1
Energy contribution in proteins		
Low	47	15.4
Normal	258	84.6
Energy contribution in carbohydrate		
Low	23	7.5
Normal	117	38.4
High	165	54.1
Energy contribution in fats		
Low	166	54.4
Normal	112	36.7
High	27	8.9
Energy contribution for the three macronutrients		
Adequate	60	19.7
Inadequate	245	80.3

Table 2: *Distribution of pregnant according to the energy contributions.*

Biochemical parameters	N	%
Hemoglobin rate		
Normal	17	56.7
Low (Anemia)	13	43.3
Mean blood volume		
Normal	20	66.7
Low	5	16.7
High	5	16.6
Serum iron		
Normal	12	40
Low	18	60
Red blood cells		
Normal	28	93.3
Low	2	6.7
Blood platelets		
Normal	26	86.7
Low	4	13.3
Leukocytes count		
Normal	24	80
High	6	20
Lymphocytes count		
Normal	26	86.7
Low	4	13.3
Blood glucose		

Normal	20	65.6
Low	5	17.2
High	5	17.2
Serum Albumin		
Normal	17	56.7
Low	13	43.3
Serum Calcium		
Normal	26	86.7
Low	3	10
High	1	3.3
Serum Magnesium		
Normal	28	93.3
Low	2	6.7

Table 3: *Distribution of pregnant according to the rate of nutrients and biologic marquers of the nutritional status (n = 30).*

Discussion

Lifestyle

The high prevalence of physical inactivity in this survey is 78.2%. The majority of pregnant women are not very active; however, it was not possible to verify the effect of this physical inactivity on their nutritional status. However, the proportion of pregnant women could be reduced through better physical activity.

The same observation was made by N. Caius who n ted in his study that the level of physical activity could have a greater impact on his adolescent population. Thus, special attention should be paid to eating habits and physical activity from an early age, given the risks of developing degenerative diseases in adulthood [7].

Better still, this prevalence reflects the prevalence of sedentary leisure activities observed in the Beninese population according to data from the Step survey in 2007 among women (86.44%) [4]. The high proportion of inactive pregnant women who do not engage in any physical activity outside of household activities shows that a gap remains to be filled in the recognition of the benefits of physical activity during pregnancy. Indeed, physical activity is highly recommended for pregnant women and helps to maintain agility, fluidity of blood flow and prevent chronic disease. A sedentary lifestyle is accepted only on medical advice if there is a threat of abortion or premature delivery. However, the high proportion of sedentary pregnancies could also be explained by the sedentary occupations of the majority of pregnant women.

The consumption of alcohol is observed at 49.8% of the Beninese women. The consumption of coffee is daily at 17.7% of the gestates whereas the effect of caffeine is especially recognized like harmful for the fetus especially generating of deaths in utero and the risk deludes itself according to the number of cups consumed. Although weak the prevalence of consumption of the alcohol and coffee is weak in our survey, these habits of life deserve to be the subject of sanitary education at pregnant. It is some in the same way for the consumptions of non-nourishing substances as the cola and the clay.

Diet

Diet habits

The food of pregnant is dense in energy (rich in carbohydrate and in greasiness) and poor in fruits and vegetables like the food habits of the Beninese population. The essential sources of construction nutriments as the proteins to high biologic value as well as the fruits and vegetables are not consumed every day. The rarity of the consumption of meats and poultries could expose pregnant to a deficiency in B12

vitamin that is exclusive of animal origin but also a deficiency made of iron. This weak contribution made of haem iron could really explain the strong proportion of gestates anomalies (43.6%), as well as those having a hypoferritinemia (60%) therefore having exhausted their reserve made of iron. This prevalence is similar to the one of 41% reported by the demographic investigation of health (EDS 2012) [3]. The prevalence of the anemia of 43.3% observed in the present survey is similar to the one reported in the survey of Makoutodé and al to Porto-Novo in 2004 to Benin (48%) [8] but extensively lower to the one returned by Koura and al in the south of Benin in 2013 (65.7%) [9]. Although being in regression (61.3% in 2006 to 41.4% some 2012) [3], anemia at the mothers merit of the more aggressive actions notably in food, in complement to all other actions of the Beninese health system (prevention of the malaria, supplement of iron and folic acid, supplementation of food etc). It is primordial to appreciate the reserves made of iron in the beginning of pregnancy bus if the reserves are insufficient in beginning of pregnancy; a risk of iron deficiency anemia exists at the mother, prematurity and fetal hypotrophy. Otherwise, one could think that the strong consumption of fish by the majority of the gestates is to encourage because it is beneficial because fish is a good source of proteins and contains indispensable fatty acids to the development of the child's nervous system and to the mother's health. However, the strong concentrations of residues of pesticides, metals heavy and other present pollutants in fish fished in the Beninese waters (pazou, okoumassoun….), as well as in those imported (…..), make that strong recommendations of reduction must be emitted on the consumption of fish by the pregnant women. Some studies must be made in order to sustain these recommendations.

Energy contributions

For the majority of pregnant, the main source of energy comes from the carbohydrate for the majority among them of which 54.1% have a more elevated contribution than the norm. The contributions in fats are rather weak for the majority (54.4%) and (8.9%) passed the recommendations. This dense food in energy is favorable to the ponderal overcharge that we could not appreciate unfortunately. Otherwise, the contributions in protein are only weak for 15% of pregnant women; however, it is not about the proteins of high nourishing values. Some adequate information should be brought so much to the pregnant that to the staff of health for more adequate nutritional advice and a more suitable nutritional follow-up that aim to encourage a healthy food while minimizing the effect of these myths and forbidden food.

Nutritional status

In our survey, 1% of pregnant woman are malnourished. This prevalence is a lot weaker than the one observed in the survey achieved in six lacustrine townships to the south of Benin in 2008 that was of 9,1% [9]. The difference between the prevalence could explain itself by the fact that the lacustrine population is farming and the one of the population of CHU-MEL is urban.

The prevalence of undernutrition in our survey is lower than that reported by the statistics of the demographic survey in Madagascar, which recorded a prevalence of 26.7% in 2008 - 2009 [10]. Otherwise, the prevalence of the undernutrition observed in the survey is lower than the one returned for the women in age to procreate to Benin that is of 9%. The weak proportion of undernutrition observed in the present survey could justify itself by the fact that the gestates of the CHU-MEL receives a nutritional education so much group that individual even though the proportion of women that received nutritional advice individually is relatively weak (19.7%). The advice on the food at the time of the CPN aims to reinforce their knowledge or even convenient food and so, omen of a good nutritional status. Let us note that the city of Cotonou is an urban zone where the prevalence of the malnutrition is generally weaker than in the other regions of the country. According to EMICOV 2011 the departments the more touched by the food insecurity Benin are the Atacora 47.1%, the Borgou 30.0%, the Zou 28.4% and the Donga 28.0% [11].

However, if the states of overweight and obesity had can be tracked down, we suspect that the proportion of these nutritional states would be raised at our pregnant. It is the case of a survey led by Partyka in March 2015 at the Caribbean women where the prevalence of the obesity was of 20.2**%** [12].

The prevalence of the arterial hypertension in our survey is of 6.9% and adjoin the one observed in the survey of Clivaz., *et al*. that returned a prevalence understood between 5 to 10% in Switzerland (2006) [13]. On the other hand, this prevalence is lower to the one observed in the Beninese population at the time of the investigation STEPS 2008 (27.5%) [8] and as weaker than the one returned by Mboudou., *et al.* in 2009 to Cameroon (15.4%) [14]. The prevalence of diabetes gestational in our survey is of (17%), superior to the one of 6% observed in France by Puech in 2002 [15]. This strong prevalence could be the reflection of the food obesogenic rich in carbohydrate and fat matters, poor in fruits and vegetables, as well as the weak convenient of the physical activity observed in our survey.

The prevalence of hypoalbuminemia, hypocalcemia, and hypomagnesemia within the population of the survey is respectively: 43.3%, 10% and 6.7%. On the other hand, it is lower to the value returned by Konan and al in 2015 in Abidjan (26.9%) [16]. This weak rate of hypocalcemia could explain itself by the strong consumption of fish in our population of the survey.

The present survey carrying on the food, the life style and the nutritional status of the external pregnant of the CHU-MEL shows that a very weak proportion of pregnant is in undernutrition but the states of overweight and obesity don't have can be tracked down. The food is inadequate for the majority of pregnant, characterized by a contribution raised in carbohydrates and a weak contribution in fats and proteins, notably meats and poultries and a weak consumption of fruits and vegetables.

Otherwise the level of knowledge of the health staff concerning nutritional education of pregnant is even middle, requiring a backing of their capacity.

Some limits of the survey deserve to be underlined. The use of the brachial perimeter as variable of appreciation of the nutritional status didn't allow us to discover of pregnant in overweight or in obesity. The diet of pregnant would have can be put in relation with this variable of the nutritional state. We suspect that the majority of pregnant would be in ponderal overcharge during the big. The non-availability of the weight before pregnancy didn't permit to appreciate the hold of weight during pregnancy. The survey of the gain of weight of pregnant and the tracing of the curve of weight during pregnancy would have permitted to track down the holds of weight beyond the recommendations.

The non-probability sampling method and the convenience technique do not allow the results to be extrapolated to all pregnant women in Cotonou but only to the CHU-MEL consultants. The small sample size of the pregnant women who were tested for blood levels could explain the absence of significant associations between serum nutrient levels and the nutritional status of the pregnant women.

Conclusion

It appears from this study that the diet is not adequate for the majority of pregnant women, providing energy intakes that do not comply with nutritional recommendations. However, considering the brachial perimeter, the nutritional status of the pregnant women consulting at the CHU-MEL appears satisfactory for the majority. Yet, for the majority of pregnant women, several micronutrient deficiencies are observed, in particular the exhaustion of iron reserves and hyperglycemia of the gestational diabetes type.

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Volume 15 Issue 6 June 2020