Lifestyle, nutrient intake, iron status, and pregnancy outcome in pregnant women of advanced maternal age

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Abstract

The purpose of this study was to investigate how advanced maternal age influences lifestyle, nutrient intake, iron status, and pregnancy outcomes in pregnant women. The subjects of this study were 112 pregnant women who were receiving prenatal care at gynecologists located in Seoul. The subjects were divided into two groups according to their ages: those over age 35 were the advanced age group of pregnant women (AP) and those under age 35 were the young age group of pregnant women (YP). General factors, nutrient intakes, iron status, and pregnancy outcomes of the two groups were then compared. It was found that 72.5% of the YP group and 51.2% of the AP group had pre-pregnancy alcohol drinking experience; indicating that the YP group had more pre-pregnancy alcohol consumption than the AP group ($P < 0.05$). The only difference found in nutrient intake between the two groups was their niacin intakes which were $16.83 \pm 8.20 \text{ mg/day}$ and $13.76 \pm 5.28 \text{ mg/day}$, respectively. When gestational age was shorter than 38.7 weeks, the average infant birth weight was $2.95 \pm 0.08 \text{ kg}$, and when gestational age was longer than 40 weeks, it averaged about $3.42 \pm 0.08 \text{ kg}$. In other words, as gestational age increased, infant birth weight increased ($P < 0.0001$), and when maternal weight increased more than 15 kg, the infant birth weight increased significantly ($P < 0.05$). In conclusion, in order to secure healthy human resources, with respect to advanced aged women, it is necessary to intervene by promoting daily habits that consist of strategic increases in folate and calcium intake along with appropriate amounts of exercise.

Key Words: Advanced aged pregnancy, intake, lifestyle, pregnancy outcome

Introduction

Korean society is aging rapidly at an unprecedented pace and is expected to become an aged society (where people who are 65 years or older will account for more than 14 percent of the total population) by 2018 and a super aged society (where people who are 65 years or older will account for more than 20 percent of the total population) by 2026. The birth rate in 2008 was found to be 1.19, which remains at the world’s lowest level. Also, the age of pregnant women has increased, in which the average age of women giving birth to, their first child is 30.82, which is 0.23 years greater than in 2007 [1].

There are various definitions of elderly gravida but it is commonly defined as a woman who has a baby when she is over age 35. The number of elderly gravidas is not only growing in Korea, but it is also a global trend caused by late marriage, remarriage, higher education level, women’s advancement in society, and a delay in childbearing by economic factors. In Korea, the rate of elderly gravida increased from 2.0% in 1991 to 6.1% in 1994 to 13% in 2007 [1].

Hinz (USA) reported that the rate of natural childbirth declined when a mother’s age was over 40 [2], and Khoshnood (France) observed that at 40-44 years old, female fertility dropped two-fold compared to women’s who were 20-24 years old [3]. And there are many overseas reports that the maternal age is a crucial risk factor when predicting pregnancy outcomes [4-9]. However, Kale (Turkey) reported that there were no negative effects for a 45 year-old woman to deliver a large fetus [10].

Research on late childbearing in Korea showed undesirable results in terms of pregnancy, such as obstetric prognosis, chromosomal anomaly, premature birth, emergent caesarean section, and instrumental labor requiring obstetric intervention [11-16]. In other words, even though pregnant women and their newborn babies may be in good condition, late childbearing can result in a higher frequency of pregnancy complications (premature birth, presentation, pregnancy induced hypertension, gestational diabetes, placenta previa, and premature rupture of membranes), myoma of the uterus, and low birth weight infants [17]. However, there have not been many studies regarding the nutritional risk factors and nutritional status of elderly gravida. For this reason, nutritional support and specific management systems for elderly gravida have not been systematically established. Therefore, if we are able to establish systematic nutrition management for elderly gravida, it will lead to...
management of new-born nutrition. This systematic nutrition management will become a core field of application for establishing Korean health policy goals and will expand future growth drives through improved public health.

This study compared nutrient intakes, lifestyle habits, serum iron index values, and pregnancy outcomes between young and advanced aged pregnant women to provide groundwork for improving the nutritional status of pregnant women and their babies.

Subjects and Methods

Study subjects

One-hundred twelve pregnant women, excluding a woman with twins, who were receiving prenatal care at gynecologists located in Seoul as from February through June 2009, were chosen as the subjects for this study. They had been informed about the study and had agreed to participate in the survey. By setting 35 years old as the standard, about 43 pregnant women older than 35 were placed in the advanced age group (AP) whereas 69 pregnant women were placed in the young age group (YP). The study was performed by personal face-to-face interview (CHA Hospital IRB 09-03).

Data collection

Survey and preliminary investigation

A survey was produced in order to analyze the subjects’ general factors and daily lifestyle habits. To test the produced survey’s clinical adaptability, a preliminary survey was given to 20 pregnant women. The final survey was modified and compensated.

General factors and life-style investigation

General factors

Age, BMI prior to pregnancy, BMI during pregnancy, frequency of pregnancy, education level, monthly family income, occupation, morning sickness during pregnancy, and intake of nutritional supplements were investigated.

Life-style

Amount, number of times, and types of exercise, as well as alcohol consumption, smoking, caffeine intake, and house work or office work-load were investigated.

Nutrient intake

Dietary intake information was gathered from the women by direct face-to-face interview using the 24 hour recall method. For accurate and precise investigation, food eye measurements and food models were used during the interview. The nutritional value program Can-pro (Computer Aided Nutritional Analysis Program for Professionals 3.0) was used to measure and analyze the nutrient intakes of the pregnant women.

Iron status

The iron status of the subjects was investigated through hospital clinical records. Properties of the blood such as white blood cells (WBC), red blood cells (RBC), hemoglobin (Hb), hematocrit (HCT), mean corpuscula volume (MCV), mean corpuscula hemoglobin concentration (MCHC), red cell distribution width (RCDW), platelets (PLT), platelet distribution width (PDW), and mean platelet volume (MPV) were interpreted.

Pregnancy outcome

Pregnancy outcomes were determined using hospital clinical records of birth weight, birth height, Apgar score, method of delivery, period of pregnancy, mother’s weight during pregnancy, and weight gain.

Statistical analysis

All statistical data were processed by the SAS software program version 9.1 (SAS Institute, Cary, NC, USA). Every measurement was marked with a mean value ± standard deviation and percentage. The quantitative and categorical variables of the pregnant women’s age-based daily habits, nutrient intakes, and iron status were reviewed by T-tests and Chi-square analysis, respectively. According to pregnancy outcomes and levels of primary daily habits, average birth weight comparisons were performed by ANOVA.

Results

General factors

The general characteristics and environmental factors of the study subjects are described in Table 1. The average age of the YP group was 31.54 ± 2.24, and it was 37.05 ± 2.07 for the AP group. About 53.6% of YP and 34.9% of AP were primipara. The education levels of the pregnant women were relatively high: 71% of the YP group and 74% of the AP group had bachelor degrees. The AP group had higher household income than the YP group, but the difference was not considerable. More than 90% of both groups experienced morning sickness. Also, 87% for the YP group and 93% of the AP group took nutritional supplements and there was no remarkable difference between the two groups.

Lifestyle

The lifestyle habits of the subjects are summarized in Table 2. For exercise frequency during pregnancy, 27.5% of the YP group exercised once or twice a week and 32.6% of the AP group