



Preconception risk factors and SGA babies: Papilloma virus, omega 3 and fat soluble vitamin deficiencies

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ARTICLE INFO

Article history:

Received 1 January 2011

Received in revised form 18 May 2011

Accepted 6 June 2011

Keywords:

Small for gestational dates

Placenta

Vitamin D

Vitamin E

Omega 3

Papilloma virus

Telomere

ABSTRACT

Background: Small for gestational date (SGA) babies have a poor 'whole of life' prognosis and major factors affecting SGA may be present prior to conception.

Aims: To discover whether lifestyle risk factors can be identified in women planning a pregnancy.

Study design: Prospective study of women who were planning a pregnancy, who agreed to answer a detailed 250 question questionnaire prior to commencing to try to conceive, to being monitored, and within 7 days of a positive pregnancy test having a vaginal ultrasound scan and answering further questions about the events since the last menstrual period. Details of all outcomes were recorded.

Subjects: 585 couples completed the study.

Outcome measures: The relationships between birth weights and questionnaire data was analysed using SPSS and parametric statistical analysis.

Results and conclusions: 401 women (67.9% of all participants) had live births. Eleven babies (2.7%) were less than the 3rd percentile in weight and a further 22 babies (5.4%) were between the 3rd and 10th weight percentiles. Mothers of SGA babies had a lower than average education, diets that were low in meat, fish, dairy foods and nuts or seeds and were more likely to conceive in the winter. Mothers of SGA babies were significantly more likely to have had a recent abnormal Pap smear test. Air travel in the month of conception was a risk factor in having a baby less than 10th percentile.

Conclusion: The quality of lifestyle prior to conception is critical: prenatal counselling needs to be undertaken prior to conception.

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1. Introduction

Full term babies of very low birth weight may herald a shortened lifespan complicated with reduction in IQ, short stature and early onset of chronic diseases including diabetes, cardiovascular and renal disorders [1,2], and socioeconomic disadvantage [3]. Factors that have been implicated as causal in small for gestational age (SGA) births are whole of life stress, low socio-economic status, smoking, drug use [4–6] and high exposure to particulate matter in ambient air [7]. Low maternal vitamin E [8] and vitamin D status [9] have each been shown to have significant associations with SGA births.

Telomeres, the specialised ends of chromosomes are well known to shorten with each cell division and therefore with ageing. Thus it has been proposed that the placentas of SGA babies might have shorter telomeres than those of normal weight babies and such shortened telomeres have been observed [10]. Since the major elongation of telomeres occurs in the first 2 weeks after fertilisation, prior to blastocyst formation [11,12] the primary causes of SGA are

likely to exist prior to or at the time of conception. Lifestyle factors that might affect telomere length in early gestation have not yet been studied.

Prospective studies of natural pregnancies are rare and although they may suffer from bias in representation of unselected populations, the relationships between measured parameters and outcomes are consistent [13]. Because it is likely that the factors predisposing to SGA are present prior to conception and no other study has evaluated preconception lifestyle in a community setting, this paper revisits the data from a prospective study, known as the PALS (pregnancy and lifestyle study) [14] and examines the possible relationships between factors operating both pre-conception and peri-conception with SGA. The study, in which 585 couples fully participated, conducted detailed interviews of females and males prior to the couples attempting to become pregnant and then monitored the individual progress of each couple. The results of the data gathered prior to conception and within 5 days of a positive pregnancy result, suggest that interactions between protein and fat dietary factors and hours of sunlight in the season of conception play a major role in SGA. Having a history of an abnormal smear test is also strongly implicated and travelling overseas in the month of conception may also contribute to lowered birth weight. Smoking in the absence of taking vitamins or not completing high school is a lesser contributor.

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2. Methods

Before commencement, ethics approval for this study was received from the Queen Elizabeth Hospital Ethics of Research Committee. Volunteers were recruited to the study through a promotion supported by local radio, television and newspapers. Couples were invited to participate if they were planning to try to conceive in the next 6 months. All participants received a written outline of the study and gave their signed informed consent. Couples were excluded from this analysis if they were using IVF or other assisted techniques and if they had previously been investigated for fertility related problems. Because of the diversity of the local population, ethnicity was not considered. The design of the study is depicted in Fig. 1. The validity of the questionnaires was tested and the results of the validation have been published previously [14]. The extended questionnaire comprised 250 individual questions and the components of the questionnaire evaluated here are shown in Table 1. Babies with congenital abnormalities detected at birth are excluded from this analysis.

Information critical to this study:

1. The month of each conception was monitored. In each month that women attempted pregnancy they sent a specimen of urine to the laboratory on the day that their menstrual bleeding was due. If bleeding had already occurred they notified the laboratory. Women were notified of the results of the pregnancy test on the same day and a vaginal ultrasound scan was conducted within 7 days of each positive pregnancy test. A second questionnaire was administered on the same day as the scan. The major components of the two questionnaires are listed in Table 1.
2. After the birth of each baby, the attending doctor completed a form that recorded the gestation, birth weight, mode of delivery, condition of the baby at birth and any congenital abnormality noted at the immediate postnatal examination. Birth weight was expressed as a percentile for gestational age, according to

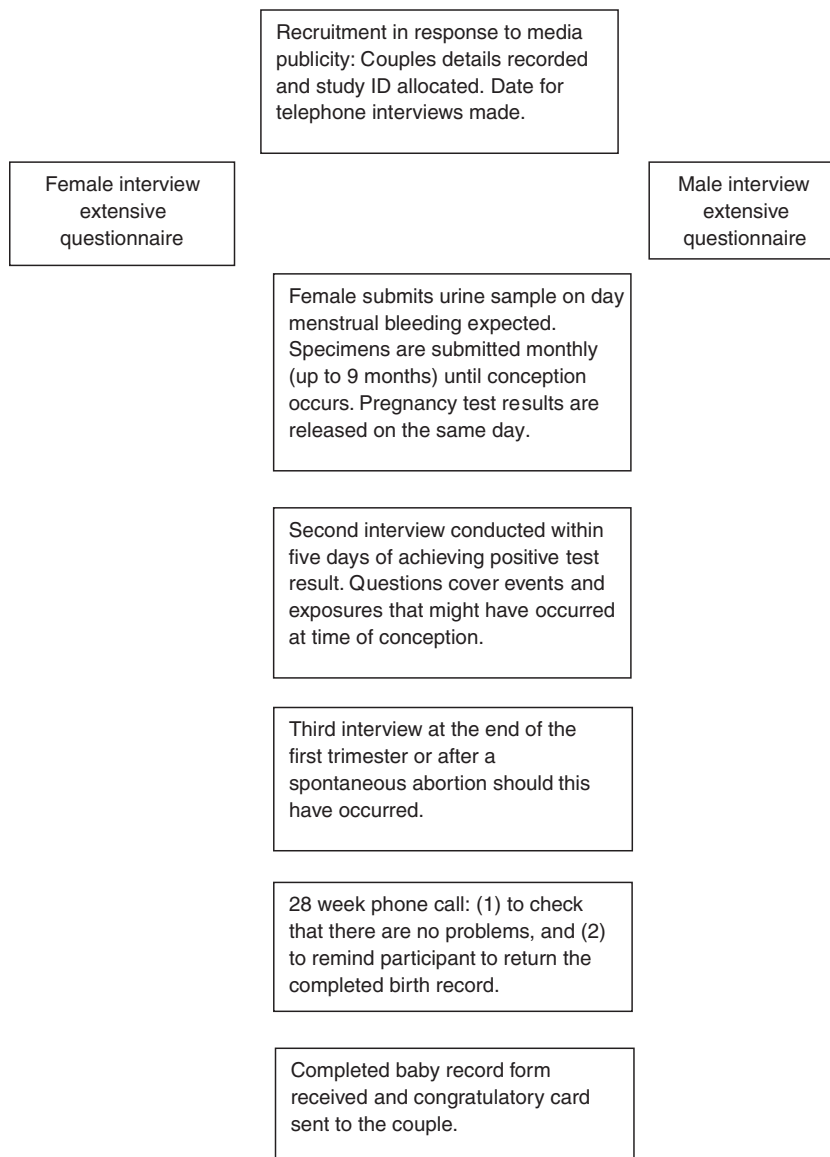


Fig. 1. PALS study design.

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