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Relationship of the lunar cycle with Down's syndrome screening and its effects

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Abstract

The present study aimed to analyze the positive rate of Down syndrome in second-trimester pregnant women in 1 lunar cycle and calculate variation coefficients of daily person numbers and daily positive rates in this population so as to explore the relationship of the lunar cycle with Down syndrome screening and its effects.

Data and laboratory results of 51,450 second-trimester pregnant women who underwent Down syndrome screening between May 2013 and June 2017 of the Chinese lunar calendar were collected. The patients were allocated into groups according to the time period of the lunar cycle based on the start date of their last menstruation. In the Chinese lunar calendar, 1 lunar cycle is divided into eight time periods. The positive rate of Down syndrome in pregnant women with the same start date of last menstruation and changes in their variation coefficients of daily person numbers and daily positive rates were analyzed.

The findings displayed the lowest positive rate of Down syndrome in the group of pregnant women who had the start date of last menstruation within the full-moon time period. The greatest variation coefficients of daily person numbers and daily positive rates were also found in the same group.

The study showed that the moon indeed affected pregnant women, and the effect reached the peak by the full moon. The effect interfered with the body homeostasis of pregnant women to a certain degree. Therefore, the relationship of the lunar cycle with Down syndrome screening reflected the interaction of the moon with the homeostasis of pregnant women.

Abbreviations: AFP = alpha fetoprotein, fβ-hCG = free β human chorionic gonadotropin.

Keywords: Chinese lunar calendar, Down's syndrome screening, full moon, last menstruation, lunar cycle, variation coefficient

1. Introduction

Studies of the moon and life aspects have attracted adequate attention in China and overseas.[1–5] Medical studies explored the relationship of the lunar cycle with cardiovascular disease, acute coronary event, gastrointestinal bleeding, rare extreme mania, and aggressive behavior.[6–10] Correlative studies covered the relationship of the lunar cycle with human delivery, birth, and birth frequency,[11–17] and also the relationship between the moon, lunar cycle, and menstrual cycle.[18,19] On the basis of previous studies, this study aimed to explore the relationship of the lunar cycle with Down syndrome screening in pregnant women using a combination of descriptive and explorative strategies. The study proved that the lunar cycle somehow affected Down syndrome screening, thereby highlighting the significance of calculating the risk rate during Down syndrome screening to further improve its accuracy and hence guiding clinical practice.

2. Materials and methods

Down syndrome screening is a prenatal test used to measure serum AFP (alpha fetoprotein) and fβ-hCG (free β human chorionic gonadotropin) levels in the second-trimester pregnancy and calculate the risk rate based on factors such as age and gestational week. The detection rate could reach 60%–80%. It is a simple and noninvasive method feasible for large-scale screening among pregnant women. The screening result is a probability reflecting the risk rate of pregnant women carrying a fetus with Down syndrome. The dividing line of risk rate is 1/270, with >1/270 defined as positive.

This study analyzed nearly 5 years (the Chinese lunar calendar 51 months vs the Gregorian calendar 50 months) of Down syndrome screening data and relevant information from singleton pregnancy in the second trimester (14 weeks and 0 days to 21 weeks and 6 days) of 51,450 individuals. These data were generated by the Cytogenetics Laboratory of Gansu Provincial People's Hospital Testing Center (Lanzhou City,

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Data availability statement: The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

The authors declare that they have no conflict of interest.

The study follows the principles of the Declaration of Helsinki.

Informed consent was not applicable.

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Table 1

Positive rates of 8 B time period groups in accordance with the lunar cycle.

	New moon	New moon–waxing crescent interval	Waxing crescent	Waxing crescent–full moon interval	Full moon	Full moon–waning crescent interval	Waning crescent	Waning crescent–new moon interval
Positive number	476	346	468	332	454	463	461	437
Total number	7030	5212	6881	5077	7094	6926	6900	6330
Positive rate in each group	6.77%	6.64%	6.80%	6.54%	6.40%	6.68%	6.68%	6.90%

The time period of each groups referred to: new moon - lunar 28th, 29th, 1st, and 2nd in lesser lunar months while lunar 29th, 30th, 1st, and 2nd in greater lunar months; New moon-waxing crescent interval – lunar 3rd, 4th, and 5th; waxing crescent – lunar 6th, 7th, 8th, and 9th; waxing crescent-full moon interval – lunar 10th, 11th, and 12th; full moon – lunar 13th, 14th, 15th, and 16th; Full moon-waning crescent interval – lunar 17th, 18th, 19th, and 20th; waning crescent – lunar 21st, 22nd, 23rd, and 24th; waning crescent-new moon interval – lunar 25th, 26th, and 27th in lesser lunar months while lunar 25th, 26th, 27th, and 28th in greater lunar months.

China) from May 2013 to intercalary June 2017 of the Chinese lunar calendar (June 2013 to July 2017 of the Gregorian calendar). The maternal serum samples were collected by the hospital from Lanzhou City and adjacent regions. In nearly 5 years (2013–2017), the laboratory consistently adopted Down syndrome screening double test to measure the risk rate of fetal Down syndrome in second-trimester pregnancy (14 weeks and 0 days to 21 weeks and 6 days). The biochemical analysis was conducted using a Thales Simplicity II time-resolved fluorescence immunoassay system (Guangzhou Fenghua Bioengineering Co., Ltd, China) and its corollary reagents.

First, data were collected and allocated into groups. As the Chinese lunar calendar was applied in this study, the start dates of last menstruation recorded in data sets were first converted from the Gregorian calendar to the Chinese lunar calendar. Next, the pregnancy data with the same start date of last menstruation were allocated into the same group. Therefore, 1506 days of 51 months gave rise to 1506 groups (named dataset A to differ from the other dataset). Next, each month was divided by 4 important time lines in the Chinese lunar calendar. They were the new moon, waxing crescent, full moon, and waning crescent. The new moon referred to the first lunar date of a month, with the characterization of the invisible moon; the waxing crescent was roughly the lunar 8th; the full moon was the lunar 15th; and the waning crescent was about the lunar 23rd. Each day of the 4 time lines plus the prior 2 days and following 1 day were regarded as 1 time period, which comprised 4 days; the remaining interval naturally formed 4 time periods, which comprised 3 to 4 days. Therefore, eight time periods were generated. Finally, 1506 A groups from data of 51 months were accordingly divided into 8 time periods, giving rise to another 8 data groups (named dataset B to differ from A). Then the last menstrual period starting date of that's 51 months of data is converted into the corresponding Gregorian calendar, removing those months in which the conversion of the Gregorian calendar to the lunar calendar results in a loss of days. We obtained the data of the beginning date of the last menstruation of 48 months in the Gregorian calendar. This group of data will be the control group C, which will also be divided into 8 large groups according to similar grouping method as group A (for convenience of distinction, these 8 large groups are named as Group D), and the 31st day in the Gregorian calendar will be put into I group in Group D.

This study consisted of 4 steps. In the first step, positive numbers and total numbers were analyzed according to the lunar calendar in eight B time period groups from June 2013 to intercalary June 2017 of the Chinese lunar calendar (June 2013 to July 2017 of the Gregorian calendar, 51 months), and the positive rate of each of eight B time period groups was calculated by dividing the former with the latter. Also, the change trend of positive rates was studied. The results showed the lowest positive rate of 6.40% in the full-moon time period group and the highest of 6.90% in the waning crescent–new moon interval (the end of the month) group, with a value difference of 0.005 (Table 1). Next, a line chart was plotted according to Table 1, in which the lunar cycle was matched with eight B time period groups. It more clearly displayed the lowest positive rate in the full-moon time period group and the highest positive rate in the waning crescent–new moon interval (the end of the month) group (Fig. 1). In the same way, the total positive number and total number of each group in the 8 D groups were counted, and the total positive rate was obtained by dividing the total positive number by the total positive number (Table 2). The changing trend of the total positive rate was observed, and it was found that there was no minimum value in the period corresponding to the full moon group according to the Gregorian calendar statistics, as shown in (Fig. 2)

The time period of each group referred to the following: new moon, lunar 28th, 29th, 1st, and 2nd in lesser lunar months, while lunar 29th, 30th, 1st, and 2nd in greater lunar months; new moon–waxing crescent interval, lunar 3rd, 4th, and 5th; waxing crescent, lunar 6th, 7th, 8th, and 9th; waxing crescent–full moon interval, lunar 10th, 11th, and 12th; full moon, lunar 13th, 14th, 15th, and 16th; full moon–waning crescent interval, lunar 17th,

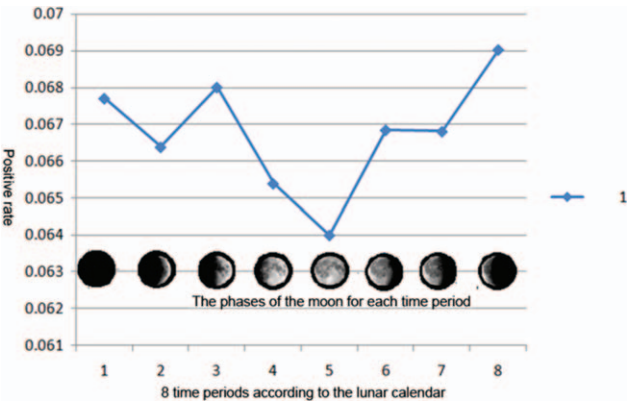

Figure 1. Line chart derived from Table 1.

Table 2

Positive rates of 8 D time period groups in accordance with the Gregorian calendar.

	I	II	III	IV	V	VI	VII	VIII
Positive number	469	342	441	347	466	443	388	468
Total number	6595	5000	6173	5206	7012	7187	5966	7468
Positive rate in each group	7.11%	6.84%	7.14%	6.67%	6.65%	6.16%	6.50%	6.27%

The time period of each groups referred to: group I - Gregorian calendar 29th, 30th, 1st, and 2nd; group II– Gregorian calendar 3rd, 4th, and 5th; group III –Gregorian calendar 6th, 7th, 8th, and 9th; group IV–Gregorian calendar 10th, 11th, and 12th; group V– Gregorian calendar 13th, 14th, 15th, and 16th; group VI–Gregorian calendar 17th, 18th, 19th, and 20th; group VII–Gregorian calendar 21st, 22nd, 23rd, and 24th; group VIII–Gregorian calendar 25th, 26th, 27th, and 28th.

18th, 19th, and 20th; waning crescent, lunar 21st, 22nd, 23rd, and 24th; and waning crescent–new moon interval, lunar 25th, 26th, and 27th in lesser lunar months, while lunar 25th, 26th, 27th, and 28th in greater lunar months.

In the second step, the numbers of pregnant women with the same start date of last menstruation in each of A groups were analyzed according to each B time period group, and the standard deviations and variation coefficients were calculated for each B time period group. The results showed the highest variation coefficient 0.7661 in the full-moon time period group, with a difference of 0.119 between the highest and the lowest values (Table 3). Next, the variation coefficients of eight B time period groups, as listed in Table 2, were used to plot a line chart, in which the lunar cycle was matched with the eight B time period groups. The line chart showed the highest variation coefficient in A groups within the full-moon time periods, for the same start date of last menstruation (Fig. 3). In the same way, the standard deviation and coefficient of variation of group D were counted, and it was found that there was no peak value in the period corresponding to the full moon group according to the Gregorian calendar statistics (Table 4) (Fig. 4).

In the third step, the numbers of pregnant women with the same start date of last menstruation and the numbers of pregnant women with positive Down syndrome screening were analyzed in each of A groups according to eight B time period groups, and the positive rates were calculated. Subsequently, the standard deviations, means, and variation coefficients of positive rates in each of 8 B time period groups were analyzed, which consisted of all positive rates in A groups. The results demonstrated the highest variation coefficient of 0.9144 in the full-moon time period group; the difference between the highest and lowest was 0.167. The variation coefficients of eight B time period groups, as listed in Table 5, were applied to a line chart, matching with the lunar cycle. It displayed the highest variation coefficient of positive rates of all A groups within the full-moon time period group (Fig. 5). In the same way, the standard deviation and coefficient of variation of group D were counted, and it was found that there was no peak value in the period corresponding to the full moon group according to the Gregorian calendar statistics (Table 6) (Fig. 6).

In the fourth step, the SPSS Statistics 17.0 software was used to statistically analyze the variation coefficients of the positive rates of Down syndrome and numbers of pregnant women with the same start date of last menstruation in eight B time period groups. First, the Shapiro–Wilk test proved the normal distribution of both variants (Sig >0.05). Pearson correlation analysis reflected no statistical correlation of both variation coefficients ($r=0.671$ and $P=0.068$; Table 4) (Table 7).

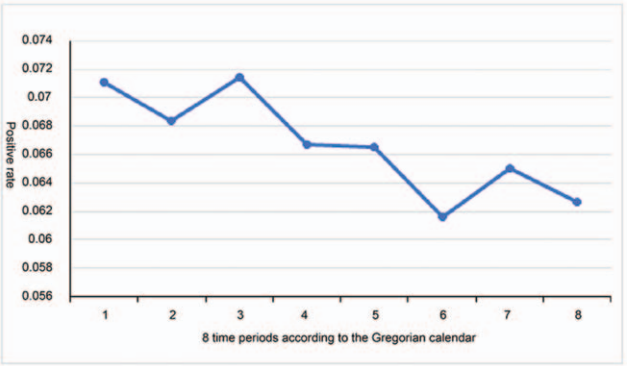

Figure 2. Line chart derived from Table 2.

3. Results

This study collected and sorted data and laboratory results of 51,450 singleton pregnant women who underwent Down syndrome screening in the second trimester (14 weeks and 0 days to 21 weeks and 6 days), spanning 51 lunar months (50 Gregorian months) of nearly 5 years, from May 2013 to June 2017 of the Chinese lunar calendar (June 2013 to July 2017 of the Gregorian calendar). These data were allocated into 1506 groups according to the Chinese lunar date and further classified into another 8 groups of lunar time periods. The positive rates of Down syndrome in pregnant women with the same start date of last menstruation and variation coefficients of their daily numbers and daily positive rates were analyzed and compared between the eight B time period groups to explore the specific relationship of the lunar cycle with Down syndrome screening, thereby postulating the effect of the moon on Down syndrome screening.

The results of the eight B time period groups demonstrated the lowest positive rate of 6.40% in the full-moon time period group (considering the start date of last menstruation) and the highest of 6.90% in the waning crescent–new moon interval (the end of the month) group, with the value difference of 0.005. It was rational to postulate that, compared with other pregnant women, those who had the start date of last menstruation within the full-moon lunar cycle would have a lower probability of carrying a fetus with Down syndrome. Meanwhile, the results of the eight B time period groups showed that the variation coefficient of the numbers of pregnant women with the same start date of last menstruation was the highest of 0.7661 in the full-moon time period group. Hence, it was presumed that, compared with other

Table 3

Standard deviations, means, and variation coefficients of the numbers of pregnant women with the same start date of last menstruation in each of 8 B lunar time period groups.

	New moon					New moon–waxing crescent interval				Waxing crescent				Waxing crescent–full moon interval				Full moon				Full moon–waning crescent interval				Waning crescent				Waning crescent–new moon interval			
date Year&.month	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
201306	22	14		15	14	16	14	24	21	9	20	14	18	11	9	19	13	16	13	6	19	15	13	20	12	8	12	17	16	12	21
201307		16	15	10	13	11	25	18	12	14	15	25	12	12	15	12	27	9	14	11	16	21	18	16	20	6	13	12	36	17	
201308	24	10		21	14	12	16	12	23	13	16	13	12	18	11	10	16	14	27	15	14	23	13	25	20	14	23	8	13	18	13
201309		24	20	21	16	13	24	15	19	10	12	19	17	16	13	21	16	8	27	10	15	14	19	20	13	17	20	15	13	14	
201310	23	15		27	17	22	22	18	11	13	26	6	18	22	14	28	28	14	22	9	35	13	20	23	16	32	18	28	22	11	12
201311		19	15	18	19	29	18	22	15	11	31	11	14	15	19	17	13	25	26	23	33	17	19	23	17	23	22	23	31	12	
201312	22	16		34	16	13	22	24	22	20	30	20	24	24	23	21	14	55	14	24	30	26	33	23	22	40	21	35	25	25	35
201401		29	23	15	38	29	20	16	30	20	17	33	30	41	19	22	20	19	29	25	19	26	21	44	17	23	32	22	34	25	
201402	29	44		26	15	23	26	30	30	12	36	19	31	13	34	25	25	39	15	24	15	22	31	23	20	25	30	26	21	26	30
201403		12	12	12	26	18	17	18	29	22	26	25	15	30	20	26	15	18	34	20	24	28	22	30	14	16	17	33	35	19	
201404	22	33		14	20	28	20	19	18	15	21	12	15	13	22	17	19	19	25	21	17	18	23	16	25	13	9	14	16	21	13
201405		17	22	15	17	5	28	13	18	13	27	14	9	25	17	29	14	14	12	14	23	13	19	13	15	31	13	9	10	28	
201406	32	15		16	20	12	17	21	14	7	15	22	20	13	27	14	24	8	23	15	17	28	16	12	13	16	26	14	14	17	23
201407		17	22	21	34	12	21	10	35	26	15	9	16	14	21	23	10	22	15	17	21	16	21	23	9	17	13	24	13	10	
201408	27	23		26	13	14	22	10	18	9	26	15	18	13	12	15	12	22	21	32	14	22	16	17	24	21	21	19	15	25	14
201409		18	24	19	24	22	19	22	16	13	26	16	25	12	14	15	19	15	16	23	16	17	12	20	18	14	22	18	11	28	12
2014 Intercalary9		20	18	18	28	27	16	32	13	24	6	23	15	15	13	23	22	16	23	16	24	21	20	19	16	38	21	13	24	13	
201410	44	11		20	25	24	22	16	23	32	9	15	25	18	21	21	20	22	24	35	21	45	20	23	24	22	30	25	17	19	19
201411		34	16	21	33	23	30	23	25	31	15	24	13	38	25	33	29	37	25	27	29	20	30	18	29	25	24	31	29	19	
201412	32	31		32	23	26	26	19	38	19	18	27	18	18	16	38	26	28	29	39	26	21	32	20	55	25	33	30	46	44	25
201501		32	46	15	44	23	24	27	21	32	24	16	41	29	39	26	20	27	23	19	27	14	33	27	28	24	18	34	35	22	
201502	41	19		52	27	22	32	27	30	25	32	30	19	16	12	39	27	34	29	33	35	29	36	20	43	21	30	34	26	43	38
201503		34	52	33	71	23	37	37	38	51	37	36	55	30	28	56	34	34	30	48	33	43	54	39	66	38	41	45	34	74	
201504	43	32		43	32	71	32	37	52	41	86	50	30	60	29	40	19	79	44	53	58	45	45	46	72	47	78	44	50	58	
201505	40	67		42	48	68	45	76	54	55	57	47	90	48	54	76	42	51	75	65	46	53	58	55	46	65	38	86	40	62	71
201506		38	83	52	56	67	48	83	61	43	56	72	74	66	49	57	50	55	34	84	54	50	49	54	53	54	66	47	85	45	
201507	50	57		58	89	48	49	59	44	95	44	47	54	51	87	69	63	59	35	61	21	81	61	53	54	68	49	51	72	48	103
201508		48	60	82	48	86	52	44	65	38	106	59	56	68	55	80	55	58	87	35	54	81	50	57	41	61	49	59	62	55	83
201509		28	53	53	64	88	54	60	72	45	86	43	70	57	67	92	73	80	105	41	70	32	102	78	71	69	82	73	70	92	60
201510		125	67	80	79	68	98	81	80	91	60	122	54	71	92	65	126	82	75	106	53	76	106	75	84	92	108	80	81	89	
201511	82	120		55	79	85	91	118	75	82	99	62	141	66	90	93	93	137	87	81	123	68	70	64	129	81	94	115	126	90	85
201512		115	77	135	76	97	102	93	147	93	105	127	61	147	89	79	103	120	140	108	90	118	84	82	57	147	101	111	119	116	
201601	94	113		121	91	144	105	89	90	101	119	87	77	87	76	140	58	70	62	58	72	58	54	66	45	58	46	48	46	58	43
201602		46	56	20	46	30	26	29	33	34	28	20	24	16	29	12	29	24	16	26	24	8	22	9	14	12	29	26	17	19	
201603	32	21		13	25	17	27	18	18	30	20	31	26	29	21	12	36	18	18	31	21	19	25	15	28	17	15	27	23	20	23
201604		21	26	22	22	17	29	13	26	20	20	24	16	17	22	23	33	14	19	16	21	33	22	17	39	7	15	18	33	18	
201605	22	21		27	28	19	18	15	22	16	16	16	13	29	12	9	23	15	30	22	19	14	22	27	15	13	27	14	25	23	
201606	23	17		16	19	14	19	22	19	29	14	23	17	15	33	19	20	17	13	26	17	10	19	27	32	15	25	22	13	17	16
201607		23	21	21	12	23	20	16	14	13	22	19	16	14	15	26	22	9	24	15	34	8	16	24	14	14	23	17	21	16	
201608	17	10		19	24	19	21	16	16	20	19	9	21	13	28	20	14	27	15	17	23	11	39	17	16	24	20	34	21	36	39
201609		22	24	44	27	40	30	47	46	40	39	25	64	36	46	35	27	68	35	36	42	30	66	31	33	50	25	55	36	36	45
201610		25	27	20	39	34	41	35	58	31	33	35	27	59	30	39	27	28	56	33	47	46	30	64	29	27	40	45	63	28	
201611	36	60		22	40	43	24	39	37	45	42	36	49	29	66	35	31	141	38	63	34	50	53	25	87	23	31	37	37	40	27
201612		32	36	26	30	16	38	31	21	17	33	15	18	26	17	34	20	20	27	25	42	18	22	25	17	56	19	29	28	31	54
201701		32	34	50	27	37	31	52	43	28	39	35	40	43	42	26	48	24	32	38	54	41	33	27	35	33	53	21	34	30	
201702	36	46		38	33	42	51	34	35	31	35	21	29	34	18	35	20	24	34	39	59	26	40	42	28	59	27	36	38	34	43
201703		37	37	49	20	29	18	45	31	35	28	45	38	41	41	30	49	26	32	36	20	57	42	27	31	31	60	25	32	34	
201704	24	43		39	28	36	17	32	48	28	37	28	35	28	32	29	27	43	22	32	38	28	46	30	44	37	33	56	18	31	34
201705		32	30	27	37	37	21	25	12	42	28	35	28	32	25	30	35	25	44	18	41	25	26	48	28	19	35	27	48	27	
201706	29	19		23	33	31	30	34	11	28	38	19	26	29	45	23	26	21	28	40	29	29	16	23	46	38	27	36	17	32	
2017 Intercalary 6	22	28		25	23	39	26	23	38	26	34	17	31	23	28	23	25	28	15	24	18	36	22	20	28	30	26	16	16	14	17
Standard deviation	23.3230					24.4472			24.9623				24.0234			26.6401				21.9708				22.7899				24.1385			
Mean	34.4608					34.0654			33.7304				33.1830			34.7745				33.9510				33.8235				35.1667			
Variation coefficient	0.6768					0.7177			0.7401				0.7240			0.7661				0.6471				0.6738				0.6864			

The time period of each of B groups referred to the following: new moon, lunar 28th, 29th, 1st, and 2nd in lesser lunar months, while lunar 29th, 30th, 1st, and 2nd in greater lunar months; new moon–waxing crescent interval, lunar 3rd, 4th, and 5th; waxing crescent, lunar 6th, 7th, 8th, and 9th; waxing crescent–full moon interval, lunar 10th, 11th, and 12th; full moon, lunar 13th, 14th, 15th, and 16th; full moon–waning crescent interval, lunar 17th, 18th, 19th, and 20th; waning crescent, lunar 21st, 22nd, 23rd, and 24th; and waning crescent–new moon interval, lunar 25th, 26th, and 27th in lesser lunar months, while lunar 25th, 26th, 27th, and 28th in greater lunar months. The results demonstrated the highest variation coefficient of daily numbers in the full-moon time period group.

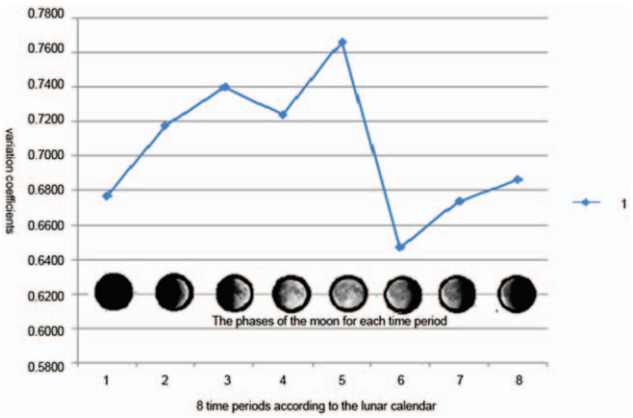

Figure 3. Line chart of 8 variation coefficients of B time period groups derived from Table 3.

pregnant women, the variation of daily numbers caused by certain factors was greater in women with the start date of last menstruation within the full-moon lunar cycle and the influencing factor was likely the moon. In this study, data from the Gregorian calendar starting date of the last menstrual cycle were used as the control group, and the same statistics were carried out. However, the same data change trend did not appear in the period corresponding to the full moon (i.e., the full moon) group, which proved that such a change trend would only appear when the statistics were made based on the lunar calendar.

This study also analyzed the variation coefficients of positive rates in pregnant women with the same start date of last menstruation. The results of the eight B time period groups demonstrated the highest of 0.9144 in the full-moon time period group. Therefore, the variation of daily positive rates reached the highest in pregnant women with the start date of last menstruation within the full-moon lunar cycle. This phenomenon was caused by some influencing factors, which could be the moon or changes in daily numbers of pregnant women with the start date of last menstruation within the full-moon lunar cycle. This hypothesis was evaluated in the fourth step of this study by conducting the correlation analysis of the variation coefficient of person numbers with the variation coefficient of the positive rates of Down syndrome in pregnant women who had the same start date of last menstruation. No statistical correlation was detected between 2 variation coefficients ($r=0.671$, $P=.068$), indicating that the change in daily numbers of pregnant women with the same start time of last menstruation caused no change in the variation of daily positive rates. Therefore, it was presumed that the moon could be the influencing factor for a greater variation of daily positive rates in the full-moon time period group. the full moon had an effect on the number of pregnant women with the same start date of last menstruation and their positive rates of Down syndrome, respectively,leading to the highest monthly values of both.

4. Discussion

The conclusions and hypothesis were confirmed by applying a very specific grouping method, which was different but based on

Table 4

Standard deviations, means, and variation coefficients of the numbers of pregnant women with the same start date of last menstruation in each of 8 D Gregorian calendar time period groups.

date	I				II			III			IV			V			VI			VII			VIII		
Year &.month	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
201308	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
	12	8	12	38	19	12	21	16	15	10	13	11	25	18	12	14	15	25	12	12	15	12	27	9	14	11	16	21	18	16	20
201309	26	34	17	17	16	24	10	21	14	12	16	12	23	13	16	13	12	18	11	10	16	14	27	15	14	23	13	25	20	14	23
201310	6	13	12	36	17	24	20	21	16	13	24	15	19	10	12	19	17	16	13	21	16	8	27	10	15	14	19	20	13	17	20
201311	8	13		18	13	27	17	22	22	18	11	13	26	6	18	22	14	28	28	14	22	9	35	13	20	23	16	32	18	28	22
201312	15	13	14	23	15	18	19	29	18	22	15	11	31	11	14	15	19	17	13	25	26	23	33	17	19	23	17	23	22	23	31
201401	11	12		19	15	13	22	24	22	20	30	20	24	24	23	21	14	55	14	24	30	26	33	23	22	40	21	35	25	25	35
201402	12	22	16	34	16	20	16	30	20	17	33	30	41	19	22	20	19	29	25	19	26	21	44	17	23	32	22	34	25	29	44
201403	29	23	15	38	29	23	26	30	30	12	36	19	31	13	34	25	25	39	15	24	15	22	31	23	20	25	30	26	21	26	30
201404				26	15	17	18	29	22	26	25	15	30	20	26	15	18	34	20	24	28	22	30	14	16	17	33	35	19	22	33
201405	12	12	12	26	18	19	18	15	21	12	15	13	22	17	19	19	25	21	17	18	23	16	25	13	9	14	16	21	13	17	22
201406	14	20		28	20	18	13	27	14	9	25	17	29	14	14	12	14	23	13	19	13	15	31	13	9	10	28	32	15	16	20
201407	15	17	5	28	13	7	15	22	20	13	27	14	24	8	23	15	17	28	16	12	13	16	26	14	14	17	23	17	22	21	34
201408	12	17		21	14	15	9	16	14	21	23	10	22	15	17	21	16	21	23	9	17	13	24	13	10	27	23	26	13	14	22
201409	12	21	10	35	26	18	13	12	15	12	22	21	32	14	22	16	17	24	21	21	19	15	25	14	18	24	19	24	22	19	22
201410	10	18	9	26	15	25	12	14	15	19	15	16	23	16	17	12	20	18	14	22	18	11	28	12	20	18	18	28	27	16	32
201411	16	13		26	16	15	13	23	22	16	23	16	24	21	20	19	16	38	21	13	24	13	44	11	20	25	24	22	16	23	32
201412	13	24	6	23	15	21	21	20	22	24	35	21	45	20	23	24	22	30	25	17	19	19	34	16	21	33	23	30	23	25	31
201501	9	15		25	18	33	29	37	25	27	29	20	30	18	29	25	24	31	29	19	32	31	32	23	26	26	19	38	19	18	27
201502	15	24	13	38	25	28	29	39	26	21	32	20	55	25	33	30	46	44	25	32	46	15	44	23	24	27	21	32	24	16	41
201503	18	18	16	38	26	26	20	27	23	19	27	14	33	27	28	24	18	34	35	22	41	19	52	27	22	32	27	30	25	32	30
201504				29	39	34	29	33	35	29	36	20	43	21	30	34	26	43	38	34	52	33	71	23	37	37	38	51	37	36	55
201505	19	16	12	39	27	34	30	48	33	43	54	39	66	38	41	45	34	74	43	32	43	32	71	32	37	52	41	86	50	30	60
201506	30	28		56	34	53	58	45	45	46	72	47	78	44	50	58	40	67	42	48	68	45	76	54	55	57	47	90	48	54	76
201507	29	40	19	79	44	46	53	58	55	46	65	38	86	40	62	71	38	83	52	56	67	48	83	61	43	56	72	74	66	49	57
201508	42	51		75	65	50	49	54	53	54	66	47	85	45	50	57	58	89	48	49	59	44	95	44	47	54	51	87	69	63	59
201509	50	55	34	84	54	53	54	68	49	51	72	48	103	48	60	82	48	86	52	44	65	38	106	59	56	68	55	80	55	58	87

(continued)

Table 4

(continued).

date Year &.month	I 29	30	31	1	2	II 3	4	5	III 6	7	8	9	IV 10	11	12
201510	35	61	21	81	61	57	41	61	49	59	62	55	83	28	53
201511	35	54		81	50	71	69	82	73	70	92	60	125	67	80
201512	41	70	32	102	78	84	92	108	80	81	89	82	120	55	79
201601	53	76		106	75	94	115	126	90	85	115	77	135	76	97
201602	68	70	64	129	81	111	119	116	94	113	121	91	144	105	89
201603	84	82	57	147	101	48	46	58	43	46	56	20	46	30	26
201604	45			58	46	17	19	32	21	13	25	17	27	18	18
201605	9	14	12	29	26	20	23	21	26	22	22	17	29	13	26
201606	17	15		27	23	22	21	27	28	19	18	15	22	16	16
201607	7	15	18	33	18	17	16	19	14	19	22	19	29	14	23
201608	14	25		23	23	21	12	23	20	16	14	13	22	19	16
201609	13	17		23	21	19	21	16	16	20	19	9	21	13	28
201610	16	17	10	19	24	40	30	47	46	40	39	25	64	36	46
201611	22	24		44	27	41	35	58	31	33	35	27	59	30	39
201612	25	27	20	39	34	39	37	45	42	36	49	29	66	35	31
201701	22	40		43	24	21	17	33	15	18	26	17	34	20	20
201702	26	30	16	38	31	28	39	35	40	43	42	26	48	24	32
201703	27	37	31	52	43	35	31	35	21	29	34	18	35	20	24
201704				51	34	35	28	45	38	41	41	30	49	26	32
201705	20	29	18	45	31	37	28	35	28	32	29	27	43	22	32
201706	17	32		48	28	35	28	32	25	30	35	25	44	18	41
201707	21	25	12	42	28	26	29	45	23	26	21	28	40	29	29
Standard deviation	22.7092					23.8264			21.9164				26.0267		
Mean	30.9296					34.7222			32.1510				36.1528		
Variation coefficient	0.7342					0.6862			0.6817				0.7199		

date Year &.month	V 13	14	15	16	VI 17	18	19	20	VII 21	22	23	24	VIII 25	26	27	28
201510	53	64	88	54	60	72	45	86	43	70	57	67	92	73	80	105
201511	79	68	98	81	80	91	60	122	54	71	92	65	126	82	75	106
201512	85	91	118	75	82	99	62	141	66	90	93	93	137	87	81	123
201601	102	93	147	93	105	127	61	147	89	79	103	120	140	108	90	118
201602	90	101	119	87	77	87	76	140	58	70	62	58	72	58	54	66
201603	29	33	34	28	20	24	16	29	12	29	24	16	26	24	8	22
201604	30	20	31	26	29	21	12	36	18	18	31	21	19	25	15	28
201605	20	20	24	16	17	22	23	33	14	19	16	21	33	22	17	39
201606	16	13	29	12	9	23	15	30	22	19	14	22	27	15	13	27
201607	17	15	33	19	20	17	13	26	17	10	19	27	32	15	25	22
201608	14	15	26	22	9	24	15	34	8	16	24	14	14	23	17	21
201609	20	14	27	15	17	23	11	39	17	16	24	20	34	21	36	39
201610	35	27	68	35	36	42	30	66	31	33	50	25	55	36	36	45
201611	27	28	56	33	47	46	30	64	29	27	40	45	63	28	36	60
201612	141	38	63	34	50	53	25	87	23	31	37	37	40	27	32	36
201701	27	25	42	18	22	25	17	56	19	29	28	31	54	32	34	50
201702	38	54	41	33	27	35	33	53	21	34	30	36	46	38	33	42
201703	34	39	59	26	40	42	28	59	27	36	38	34	43	37	37	49
201704	36	20	57	42	27	31	31	60	25	32	34	24	43	39	28	36
201705	38	28	46	30	44	37	33	56	18	31	34	32	30	27	37	37
201706	25	26	48	28	19	35	27	48	27	29	19	23	33	31	30	34
201707	16	23	46	38	27	36	17	32	22	28	25	23	39	26	23	38
Standard deviation	25.8750				26.5477				20.1001				25.4511			
Mean	36.5208				37.4323				31.0729				38.8958			
Variation coefficient	0.7085				0.7092				0.6469				0.6543			

The time period of each of D groups referred to the following: group I - Gregorian calendar 29th, 30th, 1st, and 2nd; group II– Gregorian calendar 3rd, 4th, and 5th; group III –Gregorian calendar 6th, 7th, 8th, and 9th; group IV– Gregorian calendar 10th, 11th, and 12th; group V–Gregorian calendar 13th, 14th, 15th, and 16th; group VI–Gregorian calendar 17th, 18th, 19th, and 20th; group VII–Gregorian calendar 21st, 22nd, 23rd, and 24th; group VIII–Gregorian calendar 25th, 26th, 27th, and 28th.

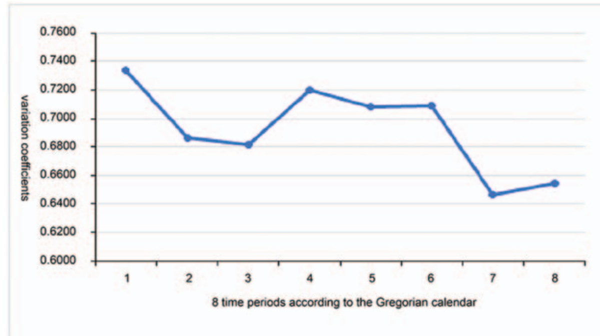

Figure 4. Line chart of 8 variation coefficients of D time period groups derived from Table 4.

previous studies. The participants were allocated into different groups according to the start lunar date of last menstruation recorded in Down syndrome screening data. As the Chinese lunar calendar reflects the lunar cycle, four important lunar time lines were adopted to divide each month: new moon, waxing crescent, full moon, and waning crescent. This grouping method favored data analysis and processing, and had a unique study vision. This study explored the effect of the moon on Down syndrome screening from 2 perspectives. In the first step, data of 51 months were sorted and analyzed, demonstrating the lowest positive rate of Down syndrome in the full-moon lunar cycle out of eight B time period groups. It indicated that the moon was involved in or affected pregnant women carrying a fetus with Down syndrome to a certain degree, and its effect reached the peak by the full moon. In the second step, the variation coefficients of numbers of pregnant women with the start date of last menstruation in the same time period were analyzed, and the variation coefficients of their positive rates of Down syndrome were calculated. The results demonstrated that both variation coefficients reached the highest in the full-moon time period group, indicating the greatest variation and changes in this group. Therefore, it was postulated that the moon acted as an interference factor, interfering with the original variation in both data and achieving the maximum significance in the full-moon lunar cycle.

5. Conclusions

This study proved that the moon indeed affected pregnancy, reaching the peak by the full moon. However, this effect was mild and could be measured only after the long-term accumulation of relevant data. Moreover, based on these results, it was postulated that since pregnant women had their own homeostasis, pregnancy-relevant measurements would fluctuate around a certain value in some time periods. If the moon affected pregnant women, their body homeostasis would resist it to preserve the original balance. Hence, the measurements at this time point would display more fluctuation around a certain value. The variation coefficients of numbers of pregnant women with the start time of last menstruation in the full-moon time period and the variation coefficients of their positive rates of Down syndrome were the highest out of the eight B time period groups, indicating the greatest variations and changes. These data reflected that the moon interfered with the body homeostasis of pregnant women, reaching the peak by the full-moon lunar

Table 5

Standard deviations, means, and variation coefficients of positive rates in each of 8 B time period groups comprising all A groups.

	new moon					New moon–waxing crescent interval			Waxing crescent				Waxing crescent-full moon interval			Full moon				Full moon–waning crescent interval				Waning crescent				Waning crescent–new moon interval			
date Year&.month	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
201306	0.0000	0.0000		0.0667	0.2143	0.0625	0.0000	0.0833	0.2381	0.1111	0.1500	0.0000	0.0000	0.1818	0.1111	0.1579	0.0769	0.1250	0.3846	0.1667	0.0526	0.2000	0.0769	0.2500	0.1667	0.3750	0.0833	0.1176	0.1875	0.0000	0.0476
201307		0.1250	0.2000	0.1000	0.1538	0.0909	0.1200	0.0000	0.0833	0.0714	0.1333	0.1600	0.1667	0.0833	0.2000	0.2500	0.1111	0.1111	0.0000	0.0909	0.1875	0.0476	0.1667	0.0625	0.0500	0.0000	0.0000	0.0833	0.1111	0.1176	
201308	0.0417	0.2000		0.0476	0.2857	0.0000	0.0000	0.2500	0.2174	0.0000	0.3125	0.0769	0.3333	0.0000	0.0909	0.0000	0.0625	0.0714	0.0370	0.0667	0.0714	0.0870	0.0000	0.0000	0.0000	0.1429	0.0870	0.0000	0.0769	0.1111	0.1538
201309		0.0833	0.0000	0.0476	0.1250	0.0769	0.1667	0.0667	0.1053	0.0000	0.1667	0.1053	0.0588	0.0625	0.1538	0.0476	0.0625	0.0000	0.1111	0.1000	0.0667	0.2143	0.0526	0.0500	0.0769	0.0588	0.1000	0.1333	0.2308	0.1429	
201310	0.1304	0.2000		0.0741	0.1765	0.1818	0.1364	0.0000	0.0909	0.0769	0.0000	0.0000	0.1667	0.0909	0.0714	0.0357	0.1071	0.1429	0.0909	0.1111	0.1143	0.0000	0.0500	0.1304	0.1875	0.0313	0.0000	0.0357	0.1364	0.0909	0.0833
201311		0.1579	0.0000	0.1111	0.0526	0.0690	0.0000	0.0455	0.2000	0.0909	0.1290	0.0909	0.0714	0.0667	0.0000	0.1176	0.0000	0.0400	0.0769	0.1304	0.0606	0.0000	0.0000	0.1739	0.1176	0.0870	0.0000	0.0000	0.0645	0.0000	
201312	0.0455	0.1250		0.0000	0.0000	0.0769	0.1364	0.0417	0.1818	0.1500	0.0000	0.0500	0.1250	0.1250	0.0000	0.1429	0.1429	0.1091	0.2143	0.0417	0.0667	0.0769	0.0606	0.2174	0.1364	0.0750	0.0476	0.0571	0.1600	0.0400	0.0857
201401		0.0690	0.1739	0.0000	0.0789	0.0345	0.0500	0.1250	0.1000	0.2500	0.0588	0.0606	0.0000	0.0488	0.2105	0.0455	0.0500	0.1053	0.1034	0.1200	0.1053	0.0385	0.0952	0.0227	0.0588	0.0870	0.0625	0.0909	0.1176	0.0800	
201402	0.1724	0.1136		0.1154	0.0667	0.0870	0.0385	0.0333	0.0667	0.1667	0.0000	0.0526	0.0000	0.0000	0.0882	0.0400	0.0800	0.1538	0.1333	0.1250	0.0000	0.0455	0.0000	0.0870	0.0000	0.0000	0.1000	0.0769	0.0000	0.0385	0.0667
201403		0.0000	0.0000	0.0000	0.1154	0.1111	0.1176	0.2778	0.0000	0.1818	0.1538	0.0800	0.1333	0.1667	0.0500	0.1923	0.0000	0.0556	0.1471	0.1000	0.0833	0.1429	0.0000	0.1667	0.0000	0.0625	0.0588	0.0303	0.0857	0.0000	
201404	0.0000	0.0000		0.0000	0.1000	0.1429	0.0000	0.0526	0.2778	0.0000	0.0476	0.0833	0.0000	0.0000	0.0909	0.0588	0.0000	0.1579	0.0400	0.0000	0.0588	0.0556	0.0870	0.0000	0.0400	0.0769	0.1111	0.0000	0.0625	0.0000	0.0000
201405		0.1765	0.1818	0.0667	0.1176	0.0000	0.1429	0.0769	0.0556	0.2308	0.0741	0.1429	0.1111	0.0400	0.0588	0.0345	0.0714	0.1429	0.0833	0.0714	0.0000	0.3077	0.0526	0.0000	0.0667	0.0645	0.1538	0.0000	0.0000	0.0714	
201406	0.0000	0.0667		0.0000	0.0000	0.2500	0.1765	0.0000	0.2143	0.1429	0.0667	0.1364	0.1500	0.2308	0.0370	0.2143	0.1250	0.0000	0.0435	0.0667	0.1176	0.0714	0.1250	0.0833	0.0769	0.1875	0.1154	0.1429	0.2857	0.1176	0.0870
201407		0.0588	0.1364	0.1429	0.0588	0.1667	0.0952	0.1000	0.0571	0.1154	0.0667	0.2222	0.0000	0.1429	0.0476	0.1304	0.0000	0.0909	0.0667	0.1176	0.0000	0.0625	0.0476	0.0870	0.0000	0.1176	0.0000	0.0417	0.0000	0.1000	
201408	0.0741	0.0870		0.0000	0.0000	0.0000	0.0909	0.1000	0.0556	0.0000	0.0385	0.0667	0.0556	0.0000	0.1667	0.0667	0.0000	0.0909	0.0000	0.0938	0.1429	0.0455	0.0000	0.0588	0.0000	0.0000	0.0952	0.0526	0.1333	0.0000	0.0000
201409		0.0556	0.0417	0.0000	0.1250	0.0455	0.0526	0.0909	0.0625	0.0000	0.0385	0.0000	0.0400	0.0000	0.0000	0.0000	0.1579	0.0667	0.0625	0.0435	0.0000	0.0588	0.0000	0.0500	0.1667	0.0714	0.0455	0.0000	0.0909	0.0714	0.0833
2014 Intercalary 9		0.1000	0.0000	0.1111	0.0714	0.0370	0.0625	0.1250	0.0769	0.0417	0.0000	0.0435	0.0000	0.0667	0.0769	0.2174	0.0909	0.0625	0.0000	0.0000	0.0417	0.0476	0.0500	0.0526	0.0625	0.0263	0.1429	0.0769	0.0833	0.0000	
201410	0.0682	0.0000		0.0500	0.0800	0.1250	0.0909	0.0000	0.0000	0.1250	0.1111	0.1333	0.0400	0.0000	0.1429	0.0476	0.0500	0.0909	0.0417	0.0286	0.0000	0.0000	0.1500	0.1739	0.0417	0.0000	0.0667	0.1200	0.1176	0.1579	0.1053
201411		0.0588	0.0000	0.0000	0.0303	0.0870	0.0667	0.0435	0.1200	0.0645	0.2000	0.0417	0.0769	0.1316	0.1200	0.0909	0.2414	0.0541	0.0800	0.0741	0.1724	0.1500	0.1000	0.1667	0.0690	0.0800	0.0417	0.0323	0.0690	0.0000	
201412	0.0625	0.0323		0.1250	0.0000	0.0769	0.0000	0.0000	0.1579	0.0000	0.0556	0.0741	0.0556	0.0556	0.1250	0.0263	0.0385	0.0357	0.1034	0.0256	0.0769	0.0476	0.0313	0.1500	0.0545	0.0800	0.0606	0.0000	0.0652	0.0227	0.0000
201501		0.0313	0.0000	0.0667	0.0682	0.0435	0.0417	0.1111	0.0000	0.0313	0.0417	0.0625	0.0488	0.0345	0.1795	0.0000	0.0500	0.0000	0.0870	0.0526	0.0370	0.0714	0.0000	0.0370	0.0714	0.0833	0.1111	0.0294	0.0000	0.0909	
201502	0.0488	0.0000		0.0385	0.0741	0.0909	0.0625	0.0370	0.0333	0.0800	0.0313	0.1000	0.0526	0.0000	0.0833	0.0769	0.0741	0.0588	0.0690	0.0303	0.0857	0.0345	0.0556	0.0000	0.0233	0.0476	0.0667	0.0294	0.0769	0.0465	0.0263
201503		0.0588	0.0192	0.0606	0.0986	0.0870	0.1081	0.1351	0.0263	0.0588	0.0270	0.0278	0.0909	0.0333	0.0357	0.0357	0.0000	0.0294	0.1000	0.0833	0.0606	0.0465	0.0926	0.0256	0.0303	0.0789	0.0000	0.0889	0.0294	0.0405	
201504	0.0233	0.0313		0.0465	0.0625	0.0563	0.0938	0.0811	0.0769	0.0488	0.0349	0.0200	0.0333	0.0667	0.0690	0.0500	0.0526	0.0380	0.0227	0.0377	0.0690	0.0444	0.0667	0.0652	0.0278	0.0426	0.0641	0.0227	0.0200	0.0000	
201505	0.0500	0.0000		0.0476	0.0417	0.0882	0.0667	0.0263	0.0185	0.0545	0.0175	0.0426	0.0444	0.0417	0.0741	0.0000	0.0952	0.0392	0.0800	0.0308	0.0435	0.0377	0.0690	0.0364	0.0435	0.0615	0.0263	0.0698	0.0500	0.0484	0.0845
201506		0.0526	0.0482	0.0192	0.1071	0.0448	0.0000	0.0120	0.0164	0.0233	0.0357	0.0000	0.0000	0.0606	0.0612	0.0351	0.0400	0.0182	0.0294	0.0595	0.0556	0.0600	0.0204	0.0370	0.0566	0.0556	0.0000	0.0638	0.0824	0.0889	
201507	0.0600	0.0175		0.1207	0.0562	0.1667	0.0204	0.0508	0.0227	0.0947	0.0455	0.0213	0.0556	0.0392	0.0575	0.0145	0.0476	0.0508	0.1429	0.0656	0.0476	0.1111	0.0164	0.0566	0.0370	0.0882	0.0204	0.0588	0.0694	0.0417	0.0485
201508		0.0417	0.0500	0.0488	0.1250	0.0349	0.1346	0.0455	0.0923	0.1053	0.0660	0.0678	0.0714	0.0735	0.0182	0.0750	0.0909	0.0690	0.0805	0.1143	0.1111	0.0494	0.1000	0.0702	0.1220	0.0000	0.0816	0.0678	0.0645	0.0727	0.0602
201509		0.0714	0.0377	0.0566	0.0938	0.0909	0.0370	0.1167	0.0556	0.0444	0.0465	0.1163	0.0286	0.1579	0.0149	0.0978	0.0959	0.0375	0.0762	0.0488	0.0286	0.0313	0.0392	0.0513	0.0845	0.0725	0.0854	0.0548	0.0714	0.0652	0.1500
201510		0.0560	0.0597	0.0500	0.0633	0.0882	0.0918	0.0864	0.0500	0.0659	0.0167	0.0574	0.0926	0.0423	0.0761	0.0615	0.0397	0.0610	0.0267	0.1038	0.0189	0.0526	0.0943	0.0533	0.1310	0.0761	0.0833	0.1125	0.0494	0.1124	
201511	0.0854	0.0750		0.0364	0.0506	0.0941	0.0769	0.0508	0.0933	0.0854	0.0707	0.0323	0.0426	0.0455	0.0333	0.0753	0.0323	0.0584	0.0460	0.0370	0.0650	0.1471	0.0857	0.0625	0.0543	0.1235	0.0638	0.0522	0.0873	0.1111	0.0588
201512		0.1391	0.0519	0.0667	0.0526	0.0515	0.0392	0.0323	0.0612	0.0968	0.0762	0.1496	0.0656	0.0952	0.0899	0.0633	0.0777	0.1000	0.0643	0.0833	0.1222	0.0763	0.0833	0.0976	0.1228	0.0816	0.0495	0.0631	0.0588	0.1121	
201601	0.1170	0.0708		0.0909	0.0879	0.0903	0.0571	0.0787	0.0889	0.0792	0.0504	0.1034	0.0260	0.1149	0.0789	0.0714	0.0172	0.0714	0.0806	0.1207	0.1250	0.1034	0.0741	0.1515	0.1333	0.1552	0.1957	0.1042	0.1087	0.1724	0.1163
201602		0.1304	0.1964	0.1000	0.1304	0.1333	0.1923	0.0690	0.1515	0.1765	0.2143	0.0000	0.0417	0.0625	0.0690	0.0000	0.1379	0.2500	0.0625	0.1538	0.1250	0.0000	0.1364	0.0000	0.3571	0.2500	0.1034	0.3077	0.1176	0.0000	
201603	0.1250	0.0952		0.0000	0.0400	0.0588	0.0741	0.1111	0.0556	0.1333	0.1500	0.0968	0.0385	0.1379	0.2381	0.0833	0.0000	0.0000	0.0000	0.0968	0.1429	0.1053	0.0800	0.0667	0.0714	0.0588	0.0000	0.1481	0.0435	0.0500	0.0435
201604		0.0952	0.0385	0.2727	0.0455	0.0000	0.0690	0.0769	0.1154	0.0500	0.1500	0.0833	0.0625	0.0588	0.0909	0.0435	0.1212	0.1429	0.3684	0.1250	0.0952	0.0606	0.0455	0.2353	0.1026	0.0000	0.1333	0.1667	0.1212	0.2222	
201605	0.1818	0.0476		0.0370	0.1071	0.1579	0.1667	0.2667	0.1364	0.0000	0.2500	0.1250	0.2308	0.0690	0.0833	0.1111	0.1739	0.1333	0.0333	0.0455	0.0526	0.1429	0.0909	0.1111	0.0667	0.1538	0.1111	0.0714	0.2000	0.0435	
201606	0.2174	0.0588		0.0000	0.1579	0.0714	0.1053	0.1364	0.0526	0.0690	0.0000	0.0870	0.1176	0.0000	0.0303	0.0000	0.0000	0.1765	0.0000	0.0000	0.0588	0.0000	0.0000	0.1111	0.0000	0.0667	0.0800	0.1364	0.0000	0.1176	0.1250
201607		0.0435	0.0000	0.0000	0.0000	0.1304	0.0500	0.0625	0.0000	0.1538	0.0455	0.0000	0.0625	0.0000	0.0667	0.0000	0.1364	0.1111	0.1250	0.1333	0.0588	0.0000	0.0000	0.0417	0.0000	0.0000	0.0435	0.0000	0.1429	0.1250	
201608	0.1765	0.0000		0.0526	0.0417	0.1579	0.0000	0.0000	0.0000	0.1000	0.1053	0.0000	0.0952	0.1538	0.0714	0.0500	0.0000	0.0000	0.1333	0.1765	0.0000	0.0909	0.0769	0.0588	0.1250	0.1250	0.1000	0.1765	0.0952	0.1111	0.0769
201609		0.0000	0.0417	0.0455	0.1111	0.0750	0.0333	0.0851	0.0217	0.1000	0.0513	0.1200	0.1563	0.0556	0.1087	0.0571	0.0000	0.0882	0.0857	0.0556	0.0952	0.0000	0.0606	0.1613	0.0909	0.0400	0.0800	0.0545	0.0556	0.0833	0.0444
201610		0.0800	0.1481	0.0000	0.1538	0.0294	0.0976	0.0571	0.1034	0.0645	0.0303	0.0286	0.0000	0.0678	0.1000	0.1026	0.0000	0.0357	0.1429	0.1212	0.1489	0.0652	0.1000	0.0781	0.0345	0.0741	0.0750	0.1111	0.0794	0.0357	
201611	0.1389	0.0833		0.0909	0.0250	0.0233	0.0417	0.0256	0.0270	0.0222	0.0714	0.0000	0.0204	0.0345	0.0606	0.0286	0.0323	0.0496	0.0263	0.0000	0.0000	0.0600	0.0377	0.0400	0.0115	0.0870	0.0323	0.0270	0.0000	0.0250	0.0000
201612		0.0000	0.0000	0.0000	0.0667	0.0625	0.0000	0.0000	0.0476	0.0588	0.0000	0.0000	0.0556	0.0769	0.0588	0.0294	0.0000	0.0500	0.0000	0.0400	0.0000	0.0000	0.0455	0.0400	0.0000	0.0000	0.0526	0.0345	0.0000	0.0323	0.0185
201701		0.0625	0.0000	0.0200	0.0000	0.0000	0.0323	0.0385	0.0000	0.0000	0.0256	0.0571	0.0000	0.0233	0.0714	0.0385	0.0208	0.0000	0.0313	0.0263	0.0370	0.0000	0.1212	0.0000	0.0000	0.0000	0.0000	0.0476	0.0294	0.0333	
201702	0.1111	0.0435		0.0526	0.0909	0.0476	0.0392	0.0588	0.0286	0.0000	0.0857	0.0476	0.0345	0.0882	0.0000	0.0286	0.0500	0.0000	0.0588	0.1026	0.0508	0.1538	0.0250	0.0000	0.0000	0.0508	0.0370	0.0000	0.0526	0.0588	0.0698
201703		0.0541	0.0541	0.0000	0.1000	0.0000	0.1111	0.0000	0.0000	0.0000	0.0357	0.0222	0.0263	0.0244	0.0488	0.0333	0.0204	0.0385	0.0313	0.0278	0.0000	0.0526	0.0476	0.1111	0.0000	0.0323	0.0500	0.0400	0.0625	0.0294	
201704	0.0833	0.0233		0.0256	0.0357	0.0556	0.0588	0.0000	0.0625	0.0714	0.0000	0.0357	0.0571	0.0000	0.0625	0.0000	0.0741	0.0930	0.0000	0.0625	0.0263	0.1071	0.1087	0.0000	0.0455	0.0000	0.0909	0.0536	0.0556	0.0000	0.0588
201705		0.0625	0.0333	0.0741	0.0541	0.0270	0.0000	0.0800	0.0000	0.0714	0.0000	0.0571	0.0714	0.0000	0.1600	0.0333	0.0286	0.0000	0.0455	0.0000	0.0488	0.0800	0.0000	0.0417	0.0357	0.0526	0.0286	0.0000	0.0208	0.2222	
201706	0.0345	0.0000		0.0870	0.0303	0.0323	0.0333	0.0294	0.1818	0.0714	0.0526	0.0526	0.1154	0.0345	0.0222	0.0000	0.0769	0.0000	0.0714	0.1000	0.0690	0.1034	0.0000	0.0870	0.0652	0.0526	0.0000	0.0833	0.0000	0.0625	
2017 Intercalary 6	0.0455	0.0357		0.2000	0.1304	0.0256	0.0000	0.0435	0.0789	0.0385	0.1176	0.0588	0.0645	0.0435	0.0000	0.0000	0.0400	0.0000	0.1333	0.0000	0.0556	0.0833	0.0455	0.0500	0.1071	0.0667	0.1154	0.0000	0.0625	0.0714	0.0000
Standard deviation	0.0579					0.0565			0.0624				0.0582			0.0622				0.0502				0.0607				0.0565			
Mean	0.0681					0.0708			0.0734				0.0704			0.0681				0.0671				0.0708				0.0696			
Variation coefficient	0.8494					0.7979			0.8508				0.8266			0.9144				0.7474				0.8582				0.8113			

The time period of each of B groups referred to the following: new moon—lunar 28th, 29th, 1st, and 2nd in lesser lunar months, while lunar 29th, 30th, 1st, and 2nd in greater lunar months; new moon–waxing crescent interval—lunar 3rd, 4th, and 5th; waxing crescent—lunar 6th, 7th, 8th, and 9th; waxing crescent–full moon interval—lunar 10th, 11th, and 12th; full moon—lunar 13th, 14th, 15th, and 16th; full moon–waning crescent interval—lunar 17th, 18th, 19th, and 20th; waning crescent—lunar 21st, 22nd, 23rd, and 24th; and waning crescent–new moon interval—lunar 25th, 26th, and 27th in lesser lunar months, while lunar 25th, 26th, 27th, and 28th in greater lunar months. The results showed the highest variation coefficient of daily positive rates in the full-moon time period group.

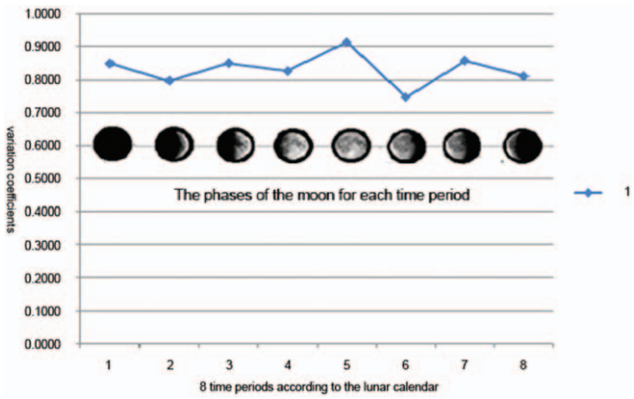

Figure 5. Line chart of variation coefficients of 8 B time period groups derived from Table 5.

cycle. This study mainly observed and analyzed the changes in the comprehensive external data, including numbers of pregnant women, their positive rates of Down's syndrome, and variation in daily positive rates of Down syndrome, without organizing and analyzing specific laboratory data, such as AFP and fβ-hCG. Risk rate of this experiment is to detect pregnant women serum AFP and fβ-hCG levels, coupled with the gestational week (from the day of the last menstrual period to the day of blood samples collected), weight, age and other data, calculated by a specific formula. the AFP and fβ-hCG levels will change with the progress of the pregnancy process continuously, in different pregnant weeks, its value is different. This experiment select risk rate as the research object, choose the date of the last menstrual period as a basis for grouping, can avoid concentration differences of the AFP and fβ-hCG because of different gestational age, but if we want to further study what caused the research results, it is necessary to research the AFP and fβ-hCG concentration change in phases of the moon cycle, this experiment did not do this, is because the hospital can't force pregnant women at a specified date to collect blood samples, this led to the collection of specimens with the same date of the last menstrual period and with the same gestational week is very difficult, The 2 screening criteria resulted in a significant reduction in the number of experimental samples, making statistical analysis impossible. This also leads to the fact that this study is not in-depth enough. If further research is to be carried out, more hospital cooperation and a large number of volunteers are needed.

Author contributions

Conceptualization: Kun Yan.
Data curation: Kun Yan.
Formal analysis: Kun Yan.
Investigation: Kun Yan, Yang Wang, Lanjun Zhong.
Methodology: Kun Yan.
Project administration: Kun Yan.
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Validation: Kun Yan, Juan Men, Yang Wang, Lanjun Zhong.
Visualization: Kun Yan, Juan Men.
Writing – original draft: Kun Yan, Juan Men.
Writing – review & editing: Kun Yan, Juan Men.

Table 6

Standard deviations, means, and variation coefficients of positive rates in each of 8 D time period groups comprising all C groups.

	I			II			III			IV			V			VI			VII			VIII		
date Year&.month	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
201308	0.1667	0.3750	0.0833	0.1176	0.1875	0.0000	0.0476	0.1250	0.2000	0.1000	0.1538	0.0909	0.1200	0.0000	0.0833	0.0714	0.1333	0.1600	0.1667	0.0833	0.2000	0.2500	0.1111	0.1111	0.0000	0.0909	0.1875	0.0476	0.1667	0.0625	0.0500
201309	0.0000	0.0000	0.0833	0.1111	0.1176	0.0417	0.2000	0.0476	0.2857	0.0000	0.0000	0.2500	0.2174	0.0000	0.3125	0.0769	0.3333	0.0000	0.0909	0.0000	0.0625	0.0714	0.0370	0.0667	0.0714	0.0870	0.0000	0.0000	0.0000	0.1429	0.0870
201310	0.0000	0.0769		0.1111	0.1538	0.0833	0.0000	0.0476	0.1250	0.0769	0.1667	0.0667	0.1053	0.0000	0.1667	0.1053	0.0588	0.0625	0.1538	0.0476	0.0625	0.0000	0.1111	0.1000	0.0667	0.2143	0.0526	0.0500	0.0769	0.0588	0.1000
201311	0.1333	0.2308	0.1429	0.1304	0.2000	0.0741	0.1765	0.1818	0.1364	0.0000	0.0909	0.0769	0.0000	0.0000	0.1667	0.0909	0.0714	0.0357	0.1071	0.1429	0.0909	0.1111	0.1143	0.0000	0.0500	0.1304	0.1875	0.0313	0.0000	0.0357	0.1364
201312	0.0909	0.0833		0.1579	0.0000	0.1111	0.0526	0.0690	0.0000	0.0455	0.2000	0.0909	0.1290	0.0909	0.0714	0.0667	0.0000	0.1176	0.0000	0.0400	0.0769	0.1304	0.0606	0.0000	0.0000	0.0000	0.1739	0.1176	0.0870	0.0000	0.0000	0.0645
201401	0.0000	0.0455	0.1250	0.0000	0.0000	0.0769	0.1364	0.0417	0.1818	0.1500	0.0000	0.0500	0.1250	0.1250	0.0000	0.1429	0.1429	0.1091	0.2143	0.0417	0.0667	0.0769	0.0606	0.2174	0.1364	0.0750	0.0476	0.0571	0.1600	0.0400	0.0857
201402	0.0690	0.1739	0.0000	0.0789	0.0345	0.0500	0.1250	0.1000	0.2500	0.0588	0.0606	0.0000	0.0488	0.2105	0.0455	0.0500	0.1053	0.1034	0.1200	0.1053	0.0385	0.0952	0.0227	0.0588	0.0870	0.0625	0.0909	0.1176	0.0800	0.1724	0.1136
201403				0.1154	0.0667	0.0870	0.0385	0.0333	0.0667	0.1667	0.0000	0.0526	0.0000	0.0000	0.0882	0.0400	0.0800	0.1538	0.1333	0.1250	0.0000	0.0455	0.0000	0.0870	0.0000	0.0000	0.1000	0.0769	0.0000	0.0385	0.0667
201404	0.0000	0.0000	0.0000	0.1154	0.1111	0.1176	0.2778	0.0000	0.1818	0.1538	0.0800	0.1333	0.1667	0.0500	0.1923	0.0000	0.0556	0.1471	0.1000	0.0833	0.1429	0.0000	0.1667	0.0000	0.0625	0.0588	0.0303	0.0857	0.0000	0.0000	0.0000
201405	0.0000	0.1000		0.1429	0.0000	0.0526	0.2778	0.0000	0.0476	0.0833	0.0000	0.0000	0.0909	0.0588	0.0000	0.1579	0.0400	0.0000	0.0588	0.0556	0.0870	0.0000	0.0400	0.0769	0.1111	0.0000	0.0625	0.0000	0.0000	0.1765	0.1818
201406	0.0667	0.1176	0.0000	0.1429	0.0769	0.0556	0.2308	0.0741	0.1429	0.1111	0.0400	0.0588	0.0345	0.0714	0.1429	0.0833	0.0714	0.0000	0.3077	0.0526	0.0000	0.0667	0.0645	0.1538	0.0000	0.0000	0.0714	0.0000	0.0667	0.0000	0.0000
201407	0.2500	0.1765		0.0000	0.2143	0.1429	0.0667	0.1364	0.1500	0.2308	0.0370	0.2143	0.1250	0.0000	0.0435	0.0667	0.1176	0.0714	0.1250	0.0833	0.0769	0.1875	0.1154	0.1429	0.2857	0.1176	0.0870	0.0588	0.1364	0.1429	0.0588
201408	0.1667	0.0952	0.1000	0.0571	0.1154	0.0667	0.2222	0.0000	0.1429	0.0476	0.1304	0.0000	0.0909	0.0667	0.1176	0.0000	0.0625	0.0476	0.0870	0.0000	0.1176	0.0000	0.0417	0.0000	0.1000	0.0741	0.0870	0.0000	0.0000	0.0000	0.0909
201409	0.1000	0.0556	0.0000	0.0385	0.0667	0.0556	0.0000	0.1667	0.0667	0.0000	0.0909	0.0000	0.0938	0.1429	0.0455	0.0000	0.0588	0.0000	0.0000	0.0952	0.0526	0.1333	0.0000	0.0000	0.0556	0.0417	0.0000	0.1250	0.0455	0.0526	0.0909
201410	0.0625	0.0000		0.0385	0.0000	0.0400	0.0000	0.0000	0.0000	0.1579	0.0667	0.0625	0.0435	0.0000	0.0588	0.0000	0.0500	0.0625	0.0263	0.1667	0.0714	0.0455	0.0000	0.0909	0.0714	0.0833	0.1000	0.0000	0.1111	0.0714	0.0370	0.0625	0.1250
201411	0.0769	0.0417	0.0000	0.0435	0.0000	0.0667	0.0769	0.2174	0.0909	0.0625	0.0000	0.0000	0.0417	0.0476	0.0500	0.0526	0.0625	0.0263	0.1429	0.0769	0.0833	0.0000	0.0682	0.0000	0.0500	0.0800	0.1250	0.0909	0.0000	0.0000	0.1250
201412	0.1111	0.1333		0.0400	0.0000	0.1429	0.0476	0.0500	0.0909	0.0417	0.0286	0.0000	0.0000	0.1500	0.1739	0.0417	0.0000	0.0667	0.1200	0.1176	0.1579	0.1053	0.0588	0.0000	0.0000	0.0303	0.0870	0.0667	0.0435	0.1200	0.0645
201501	0.2000	0.0417	0.0769	0.1316	0.1200	0.0909	0.2414	0.0541	0.0800	0.0741	0.1724	0.1500	0.1000	0.1667	0.0690	0.0800	0.0417	0.0323	0.0690	0.0000	0.0625	0.0323	0.1250	0.0000	0.0769	0.0000	0.0000	0.1579	0.0000	0.0556	0.0741
201502	0.0556	0.0556	0.1250	0.0263	0.0385	0.0357	0.1034	0.0256	0.0769	0.0476	0.0313	0.1500	0.0545	0.0800	0.0606	0.0000	0.0652	0.0227	0.0000	0.0313	0.0000	0.0667	0.0682	0.0435	0.0417	0.1111	0.0000	0.0313	0.0417	0.0625	0.0488
201503				0.0345	0.1795	0.0000	0.0500	0.0000	0.0870	0.0526	0.0370	0.0714	0.0000	0.0370	0.0714	0.0833	0.1111	0.0294	0.0000	0.0909	0.0488	0.0000	0.0385	0.0741	0.0909	0.0625	0.0370	0.0333	0.0800	0.0313	0.1000
201504	0.0526	0.0000	0.0833	0.0769	0.0741	0.0588	0.0690	0.0303	0.0857	0.0345	0.0556	0.0000	0.0233	0.0476	0.0667	0.0294	0.0769	0.0465	0.0263	0.0588	0.0192	0.0606	0.0986	0.0870	0.1081	0.1351	0.0263	0.0588	0.0270	0.0278	0.0909
201505	0.0333	0.0357		0.0357	0.0000	0.0294	0.1000	0.0833	0.0606	0.0465	0.0926	0.0256	0.0303	0.0789	0.0000	0.0889	0.0294	0.0405	0.0233	0.0313	0.0465	0.0625	0.0563	0.0938	0.0811	0.0769	0.0488	0.0349	0.0200	0.0333	0.0667
201506	0.0690	0.0500	0.0526	0.0380	0.0227	0.0377	0.0690	0.0444	0.0667	0.0652	0.0278	0.0426	0.0641	0.0227	0.0200	0.0000	0.0500	0.0000	0.0476	0.0417	0.0882	0.0667	0.0263	0.0185	0.0545	0.0175	0.0426	0.0444	0.0417	0.0741	0.0000
201507	0.0952	0.0392		0.0800	0.0308	0.0435	0.0377	0.0690	0.0364	0.0435	0.0615	0.0263	0.0698	0.0500	0.0484	0.0845	0.0526	0.0482	0.0192	0.1071	0.0448	0.0000	0.0120	0.0164	0.0233	0.0357	0.0000	0.0000	0.0606	0.0612	0.0351
201508	0.0400	0.0182	0.0294	0.0595	0.0556	0.0600	0.0204	0.0370	0.0566	0.0556	0.0000	0.0638	0.0824	0.0889	0.0600	0.0175	0.1207	0.0562	0.1667	0.0204	0.0508	0.0227	0.0947	0.0455	0.0213	0.0556	0.0392	0.0575	0.0145	0.0476	0.0508
201509	0.1429	0.0656	0.0476	0.1111	0.0164	0.0566	0.0370	0.0882	0.0204	0.0588	0.0694	0.0417	0.0485	0.0417	0.0500	0.0488	0.1250	0.0349	0.1346	0.0455	0.0923	0.1053	0.0660	0.0678	0.0714	0.0735	0.0182	0.0750	0.0909	0.0690	0.0805
201510	0.1143	0.1111		0.0494	0.1000	0.0702	0.1220	0.0000	0.0816	0.0678	0.0645	0.0727	0.0602	0.0714	0.0377	0.0566	0.0938	0.0909	0.0370	0.1167	0.0556	0.0444	0.0465	0.1163	0.0286	0.1579	0.0149	0.0978	0.0959	0.0375	0.0762
201511	0.0488	0.0286	0.0313	0.0392	0.0513	0.0845	0.0725	0.0854	0.0548	0.0714	0.0652	0.1500	0.0560	0.0597	0.0500	0.0633	0.0882	0.0918	0.0864	0.0500	0.0659	0.0167	0.0574	0.0926	0.0423	0.0761	0.0615	0.0397	0.0610	0.0267	0.1038

(*continued*)

Table 6

(continued).

date	I					II			III				IV			V				VI				VII				VIII			
Year&.month	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
201512	0.0189	0.0526		0.0943	0.0533	0.1310	0.0761	0.0833	0.1125	0.0494	0.1124	0.0854	0.0750	0.0364	0.0506	0.0941	0.0769	0.0508	0.0933	0.0854	0.0707	0.0323	0.0426	0.0455	0.0333	0.0753	0.0323	0.0584	0.0460	0.0370	0.0650
201601	0.1471	0.0857	0.0625	0.0543	0.1235	0.0638	0.0522	0.0873	0.1111	0.0588	0.1391	0.0519	0.0667	0.0526	0.0515	0.0392	0.0323	0.0612	0.0968	0.0762	0.1496	0.0656	0.0952	0.0899	0.0633	0.0777	0.1000	0.0643	0.0833	0.1222	0.0763
201602	0.0833	0.0976	0.1228	0.0816	0.0495	0.0631	0.0588	0.1121	0.1170	0.0708	0.0909	0.0879	0.0903	0.0571	0.0787	0.0889	0.0792	0.0504	0.1034	0.0260	0.1149	0.0789	0.0714	0.0172	0.0714	0.0806	0.1207	0.1250	0.1034	0.0741	0.1515
201603	0.1333			0.1552	0.1957	0.1042	0.1087	0.1724	0.1163	0.1304	0.1964	0.1000	0.1304	0.1333	0.1923	0.0690	0.1515	0.1765	0.2143	0.0000	0.0417	0.0625	0.0690	0.0000	0.1379	0.2500	0.0625	0.1538	0.1250	0.0000	0.1364
201604	0.0000	0.3571	0.2500	0.1034	0.3077	0.1176	0.0000	0.1250	0.0952	0.0000	0.0400	0.0588	0.0741	0.1111	0.0556	0.1333	0.1500	0.0968	0.0385	0.1379	0.2381	0.0833	0.0000	0.0000	0.0000	0.0968	0.1429	0.1053	0.0800	0.0667	0.0714
201605	0.0588	0.0000		0.1481	0.0435	0.0500	0.0435	0.0952	0.0385	0.2727	0.0455	0.0000	0.0690	0.0769	0.1154	0.0500	0.1500	0.0833	0.0625	0.0588	0.0909	0.0435	0.1212	0.1429	0.3684	0.1250	0.0952	0.0606	0.0455	0.2353	0.1026
201606	0.0000	0.1333	0.1667	0.1212	0.2222	0.1818	0.0476	0.0370	0.1071	0.1579	0.1667	0.2667	0.1364	0.0000	0.2500	0.1250	0.2308	0.0690	0.0833	0.1111	0.1739	0.1333	0.0333	0.0455	0.0526	0.1429	0.0909	0.1111	0.0667	0.1538	0.1111
201607	0.0714	0.2000		0.0435	0.2174	0.0588	0.0000	0.1579	0.0714	0.1053	0.1364	0.0526	0.0690	0.0000	0.0870	0.1176	0.0000	0.0303	0.0000	0.0000	0.1765	0.0000	0.0000	0.0588	0.0000	0.0000	0.1111	0.0000	0.0667	0.0800	0.1364
201608	0.0000	0.1176		0.0435	0.0000	0.0000	0.0000	0.1304	0.0500	0.0625	0.0000	0.1538	0.0455	0.0000	0.0625	0.0000	0.0667	0.0000	0.1364	0.1111	0.1250	0.1333	0.0588	0.0000	0.0000	0.0417	0.0000	0.0000	0.0435	0.0000	0.1429
201609	0.1250	0.1765	0.0000	0.0526	0.0417	0.1579	0.0000	0.0000	0.0000	0.1000	0.1053	0.0000	0.0952	0.1538	0.0714	0.0500	0.0000	0.0000	0.1333	0.1765	0.0000	0.0909	0.0769	0.0588	0.1250	0.1250	0.1000	0.1765	0.0952	0.1111	0.0769
201610	0.0000	0.0417		0.0455	0.1111	0.0750	0.0333	0.0851	0.0217	0.1000	0.0513	0.1200	0.1563	0.0556	0.1087	0.0571	0.0000	0.0882	0.0857	0.0556	0.0952	0.0000	0.0606	0.1613	0.0909	0.0400	0.0800	0.0545	0.0556	0.0833	0.0444
201611	0.0800	0.1481	0.0000	0.1538	0.0294	0.0976	0.0571	0.1034	0.0645	0.0303	0.0286	0.0000	0.0678	0.1000	0.1026	0.0000	0.0357	0.1429	0.1212	0.1489	0.0652	0.1000	0.0781	0.0345	0.0741	0.0750	0.1111	0.0794	0.0357	0.1389	0.0833
201612	0.0909	0.0250		0.0233	0.0417	0.0256	0.0270	0.0222	0.0714	0.0000	0.0204	0.0345	0.0606	0.0286	0.0323	0.0496	0.0263	0.0000	0.0000	0.0600	0.0377	0.0400	0.0115	0.0870	0.0323	0.0270	0.0000	0.0250	0.0000	0.0000	0.0000
201701	0.0000	0.0667	0.0625	0.0000	0.0000	0.0476	0.0588	0.0000	0.0000	0.0556	0.0769	0.0588	0.0294	0.0000	0.0500	0.0000	0.0400	0.0000	0.0000	0.0455	0.0400	0.0000	0.0000	0.0526	0.0345	0.0000	0.0323	0.0185	0.0625	0.0000	0.0200
201702	0.0000	0.0000	0.0323	0.0385	0.0000	0.0000	0.0256	0.0571	0.0000	0.0233	0.0714	0.0385	0.0208	0.0000	0.0313	0.0263	0.0370	0.0000	0.1212	0.0000	0.0000	0.0000	0.0000	0.0476	0.0294	0.0333	0.1111	0.0435	0.0526	0.0909	0.0476
201703				0.0392	0.0588	0.0286	0.0000	0.0857	0.0476	0.0345	0.0882	0.0000	0.0286	0.0500	0.0000	0.0588	0.1026	0.0508	0.1538	0.0250	0.0000	0.0000	0.0508	0.0370	0.0000	0.0526	0.0588	0.0698	0.0541	0.0541	0.0000
201704	0.1000	0.0000	0.1111	0.0000	0.0000	0.0000	0.0357	0.0222	0.0263	0.0244	0.0488	0.0333	0.0204	0.0385	0.0313	0.0278	0.0000	0.0526	0.0476	0.1111	0.0000	0.0323	0.0500	0.0400	0.0625	0.0294	0.0833	0.0233	0.0256	0.0357	0.0556
201705	0.0588	0.0000		0.0625	0.0714	0.0000	0.0357	0.0571	0.0000	0.0625	0.0000	0.0741	0.0930	0.0000	0.0625	0.0263	0.1071	0.1087	0.0000	0.0455	0.0000	0.0909	0.0536	0.0556	0.0000	0.0588	0.0625	0.0333	0.0741	0.0541	0.0270
201706	0.0000	0.0800	0.0000	0.0714	0.0000	0.0571	0.0714	0.0000	0.1600	0.0333	0.0286	0.0000	0.0455	0.0000	0.0488	0.0800	0.0000	0.0417	0.0357	0.0526	0.0286	0.0000	0.0208	0.2222	0.0345	0.0000	0.0870	0.0303	0.0323	0.0333	0.0294
201707	0.1818	0.0714		0.0526	0.0526	0.1154	0.0345	0.0222	0.0000	0.0769	0.0000	0.0714	0.1000	0.0690	0.1034	0.0000	0.0870	0.0652	0.0526	0.0000	0.0833	0.0000	0.0625	0.0455	0.0357	0.2000	0.1304	0.0256	0.0000	0.0435	0.0789
Standard deviation	0.0679					0.0589			0.0608				0.0554			0.0569				0.0493				0.0580				0.0466			
Mean	0.0757					0.0704			0.0736				0.0701			0.0702				0.0633				0.0676				0.0626			
Variation coefficient	0.8973					0.8363			0.8266				0.7898			0.8106				0.7791				0.8580				0.7438			

The time period of each of D groups referred to the following: group I - Gregorian calendar 29th, 30th, 1st, and 2nd; group II– Gregorian calendar 3rd, 4th, and 5th; group III –Gregorian calendar 6th, 7th, 8th, and 9th; group IV– Gregorian calendar 10th, 11th, and 12th; group V–Gregorian calendar 13th, 14th, 15th, and 16th; group VI–Gregorian calendar 17th, 18th, 19th, and 20th; group VII–Gregorian calendar 21st, 22nd, 23rd, and 24th; group VIII–Gregorian calendar 25th, 26th, 27th, and 28th.

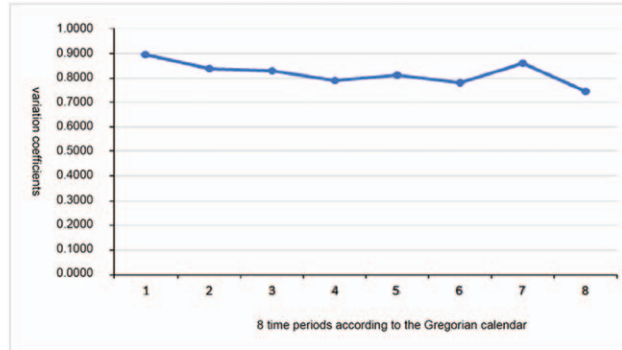

Figure 6. Line chart of variation coefficients of 8 D time period groups derived from Table 6.

Table 7

Results of Pearson correlation analysis.

	Variation coefficient of the numbers of pregnant women with the same start date of last menstruation	Variation coefficient of positive rate of Down syndrome in pregnant women with the same start date of last menstruation
New moon	0.6768	0.8494
New moon–waxing crescent interval	0.7177	0.7979
Waxing crescent	0.7401	0.8508
Waxing crescent–full moon interval	0.7240	0.8266
Full moon	0.7661	0.9144
Full moon–waning crescent interval	0.6471	0.7474
Waning crescent	0.6738	0.8582
Waning crescent–new moon interval	0.6864	0.8113
Shapiro–Wilk test	Sig = 0.893	Sig = 0.926
Pearson correlation analysis	$r = 0.671$	
Significance (two-side)	$P=0.068$	

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