New connected home ovulation test provides big data on menstrual cycles

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Background

• A new home ovulation test system, the Clearblue Connected Ovulation Test System enables women seeking to conceive the ability to monitor their fertility level via luteinising hormone and estrone-3-glucuronide measurement and obtain their results on an associated mobile phone app
• Users input cycle information in the app to guide testing
• Users’ cycle and ovulation test data is stored anonymously in the cloud, so can be analysed for big data-based insights on menstrual cycles

Methods

• Data from U.S women using the Connected Ovulation Test System (SPD Swiss Precision Diagnostics GmbH, Geneva) from 3rd September 2017 to 21st May 2018 were analysed
• This consisted of 15,104 unique user IDs, 33,094 cycle records and 171,101 ovulation test records
• Data were cleaned to remove data from validation testing, leaving 32,540 cycle records
• Python 3 and the relevant libraries including ‘pandas’ have been used to develop the Jupyter Notebooks for this analysis
• Data were compared as shown in Figure 1

Results

• When users input their cycle length at first use, 25.3% selected a 28-day cycle, with the next most common choices being 27 (10.8%), 26 (10.1%) and 30 (10.0%) days (Figure 2)
• Actual cycle length was normally distributed, with the most common length also being 28 days, but at a lower frequency of 11.8% (Figure 2)
• Very short cycles (<23 days) were seen in 5.3% of cases, and long cycles (>44 days) in 0.9%
• Of those who thought their cycle was 28 days long, 55% had their next cycle within 2 days of this estimate, but 10% fell outside the range of 23–44 days
• 52% of users with data from four cycles (n=534) had cycle lengths that varied by 5 or more days (Figure 3)

Conclusions

• In one of the biggest datasets ever examined on menstrual cycles in women seeking to conceive, the cycle length distribution and variability mirrors previous studies
• Some women appear to have poor knowledge of their cycles, selecting the textbook length of 28 days
• Cycles far shorter or longer than expected could be a result of the users’ poor understanding of their cycle or cycle irregularity
• The Clearblue Connected Ovulation Test System therefore provides women with more insight into their cycles and enables them to accurately time intercourse when trying to conceive

Declaration of interest

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