

# Menstruation and diabetes control

*How menstruation can affect diabetes control in women, and methods for tackling the problem*

## Riding two roller-coasters

*Author's note: Links marked thus <sup>(1)</sup> correspond to the numbered entries in the bibliography.*

We are all aware of the analogy about one's diabetes control being like riding a roller-coaster. The goal is to turn the roller-coaster into a go-cart running on a flat track. We want to eliminate the extreme ups and downs and keep things on an even keel. But a woman with diabetes gets to ride an additional roller-coaster at the same time; the extra ups and downs are caused by her menstrual cycle.

Many women report an elevation of blood glucose occurring from three to five days prior to the beginning of their menstrual periods. Blood sugars typically return to normal levels within the first day or two after the period starts. One medical study, conducted in England in 1993 <sup>(1)</sup>, found that as much as 67% of diabetic women reported premenstrual changes in their blood glucose levels and 70% reported changes during menstruation. These changes seem to be more prevalent in women who also suffer from other premenstrual symptoms.

This same study also found that the age at which menstruation first starts (menarche) is greater in women with diabetes than in those without. Another study, conducted in Denmark in 1987 <sup>(2)</sup>, found that for girls who develop diabetes before age ten, menarche occurs an average of one year later than for non-diabetic girls. Also, women with diabetes are more likely to experience irregular menstrual cycles than non-diabetic women.

Also of interest are the results of yet another British study published in 1991 <sup>(3)</sup>. Evidence indicates that pre-pubescent girls may begin exhibiting a cyclical disturbance in their blood glucose control as early as age nine. Generally, the result is hyperglycemia (high blood sugar) although in some instances, hypoglycemia (low blood sugar) occurs. Typically this disturbance occurs at 21–34 day intervals and lasts from two to five days. Parents of young diabetic girls are encouraged to watch for such a cycle to develop as steps can be taken to improve glucose control during this time.

What causes premenstrual changes in blood glucose? Probably the increase in female hormones estrogen and progesterone that occurs after ovulation. One theory is that increased levels of progesterone cause increased insulin resistance. This in turn leads to hyperglycemia. While most women report premenstrual *increases* in blood sugar, some do experience hypoglycemia during this time. This could be due to high levels of estrogen causing increased insulin sensitivity. For more information on this please read [Diabetes Control and a Woman's Menstrual Cycle](#) by David Fitz-Patrick, M.D. of the Diabetes & Hormone Center of the Pacific in Hawaii.

Another explanation that is frequently given is that the cravings for carbohydrates which accompany premenstrual syndrome are to blame for elevated blood sugars. While it is true that women often have increased appetites and cravings during the days leading up to menstruation, this cannot be the sole cause of premenstrual hyperglycemia. Women who use an insulin infusion pump have the advantage of being able to deliver precise amounts of insulin and can balance the insulin to the amount of carbohydrate intake. Several women who are diligent about bolusing the correct insulin dose for everything that crosses their lips still report having a premenstrual blood sugar rise. This suggests that the hormonal changes are the real reason for the increase.

Menopause also presents challenges to a woman's blood glucose control. The same problems of premenstrual hormone increases are prevalent, only in reverse. During menopause, production of progesterone and estrogen diminishes. A decrease in progesterone levels results in increased insulin sensitivity, and on the flip side, decreased estrogen can increase insulin resistance. It all depends on which hormone seems to have more control. If menopause is interfering with your diabetes control, you should discuss the problems with your doctor. One possible solution is Hormone Replacement Therapy. *This treatment has potential drawbacks and all aspects should be carefully considered before beginning HRT.* It is also important to maintain healthy eating and exercise habits throughout menopause and after. For more information on this topic, see [Diabetes and Menopause](#) by David Fitz-Patrick, M.D. of

## Let's cut to the chase. How to maintain control.

So, now that we have established that it is normal for a woman to experience changes in blood glucose before and during her menstrual period, what can we do about it? We definitely do not have to just "grin and bear it".

If you are on Multiple Daily Injections, talk to your doctor about increasing the amount of long-acting insulin you take during this time. (If you experience premenstrual hypoglycemia you should *decrease* the long-acting insulin.) Usually blood sugar returns to normal during the first day or two of menstruation and insulin doses should be restored to the normal levels at that time.

If you are using an insulin pump you can increase (or decrease) your basal rates. Assuming you have a problem with elevated blood sugars, try increasing your basal rates by 1 or 2 *tenths* of a unit. To help determine what is the correct basal rate for you, try setting a temporary basal rate one-tenth of a unit higher than you usually run. If, after three to four hours, your blood sugar levels have descended into an acceptable range, go with this as your "premenstrual" basal rate increase. Adjust all of your basal rates by this increment. You may find that a one-tenth unit increase is not enough. If this is the case, adjust it upwards by another tenth of a unit. (Note that this is now two-tenths of a unit above your original basal rate.) Wait another three hours and check again. Continue increasing by one-tenth unit increments until your blood sugar levels stabilize into an acceptable range.

Once you have determined what your premenstrual basal rates should be, you could continue to run a temporary basal rate, but the hourly beeping might drive you batty. If you are using a Disetronic pump the beeps can be silenced. Refer to your pump user's manual for instruction on how to do this. If you are using a MiniMed 507 pump, the beep volume can be turned down but not turned off altogether. Once again, refer to your user's manual. Another problem, besides the beeping, is the fact that temporary basal rates are just that: *temporary*. You need to keep resetting them until your blood sugars return to normal after the beginning of your period.

An alternative is to reprogram your basal rates as if it were a permanent change. Then, at the first sign of a "low" after your period begins, restore them to normal. This is nice because the increase in basal rates is usually needed for three to five days. It is much easier to reprogram the basals for this length of time than it would be to continually set temporary basals. The onset of menstruation should be enough of a reminder for you to be on the lookout for the inevitable drop in blood sugar. If you decide to pursue this route, I advise you to write down the start times and amounts of your basal rates before you reprogram them. This will make both reprogramming and returning to normal much easier for you.

If you are a Disetronic pump user and possess two pumps, you could program one of the pumps with your "premenstrual" basal rates and keep the other pump set up for the rest of the month. Of course this would mean changing insulin cartridges to your alternate pump when it is time for the switch.

*Changes to your insulin regimen should be made with care. Readers are advised to check with their healthcare team before making significant changes.*

## Bibliography

The following articles can be found in [Medline](#) on the Internet. Use the words "diabetes" and "menopause" as the search parameters.

1. Perimenstrual symptoms in women with diabetes mellitus and the relationship to diabetic control. June 1993, Cawood, Bancroft, and Steel; Diabet Med, vol. 10, pp 444 - 448.
2. Epidemiology of menarche and menstrual disturbances in an unselected group of women with insulin-dependent diabetes mellitus compared to controls. Aug. 1992, Kjaer, Hagen, Sand, and Eshj; J Clin Endocrinol Metab, vol. 75, pp 524 - 529.
3. Cyclical disturbance of diabetic control in girls before the menarche. Nov. 1991, Brown, Derby, and Ng; Arch Dis Child, vol. 66, pp 1279 - 1281.

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