JCD

Review Article

Problems and Solutions for Assessing Hyperglycaemia in Pregnancy in Non-metro Areas

Bhavatharini N, Changanidi ARA, Sanjeev VK, Aruyerchelvan R

S.R.C. Diabetes Care Centre, Erode

INTRODUCTION

We surveyed two corporation health centres and four upgraded "primary health centres (PHCs)" and three "government hospitals" just to see how many pregnant ladies are coming in fasting state. We found almost all the pregnant women had taken food. Nobody was in fasting. This has been evaluated in around 5,000 cases in about 6 months time, i.e., for 24 weeks every Tuesday which is "antenatal case (ANC)" day (**Fig. 1**).

Fig. 1: *Survey of a corporation health centre, upgraded "primary health centres", and "government hospitals" to see how many pregnant ladies are coming in fasting state.*

OVERLOADED

- In a recent survey done in 10 non-metro government hospitals, >90% of the antenatal cases do not come in fasting state **(Table 1 and Fig. 2).**
- Practically, if everyone takes pains to go and see what really is happening in non-metro areas there is inadequacy from A to Z.
- If these pregnant ladies are asked to come in fasting again, which is next week only not any day, workload with these inadequate staffs is going to increase further if they are asked to come again and naturally medical care will be less.

Table 1: Hospitals names and number of patients surveyed in non-metro government hospitals.

S. No.	Name	Total	F= Patients coming in Fasting state
1	Erode - GH	2,361	358
2	Cithode - PHC	878	5
3	Nambiyur - PHC	356	NO
4	Vellodu - PHC	217	NO
5	Perundurai - GH	196	4
6	Modakuruchi - PHC	73	2
7	Thiruchengodu - GH	46	NO
8	P-S-park	532	NO
9	Karungal palayam	234	NO
		4,893	369

Fig. 2: *survey done for fasting state in non-metro government hospitals.*

MISS THE BUS

Here, antenatal-OP is only on Tuesday. Since there is not enough "medical officers" for the input, they stop giving token halfway because of the overwhelming crowd and many go back without getting token and to report only next Tuesday.

INADEQUACY

For regular glucose tolerance test (GTT) three venous samples have to be taken. There are not adequate strips, reagents, syringes, laboratory technicians, paramedicals, staffs, and doctors. Even drinking water is not available. Somebody donates.

- Every PHC has to see at least 50–100 pregnant cases on ANC day.

TIME FACTOR

- Primary health centres open by 9–10 AM only. If all have to be given glucose in fasting, even if it takes just 5 minutes/case, for 50–100 patients it takes >4 hours minimum. By which time few cases would have reached 1 hour and few 2 hours also.
- So it is difficult to do GTT in fasting practically to all pregnant females with this limited facility.

PROBLEMS IN PRIMARY HEALTH CENTRES

- Wherever possible if both the "medical officer" and the other caregivers can finish their routine checkups in a single visit it will be easy for all the patients, staffs, accompanying person, and "medical officers" and to the nation. Second visit is "national waste".
- The proportion of obstetricians to patients is very low and none of them are present at all in some PHCs and are deputed from elsewhere.
  In this if some "medical officer" is on leave it becomes further difficult.

MATERNITY BENEFIT SCHEME

- Since our government gives around 18,000 rupees to all antenatal cases, even affordable class comes only to government set ups to get this "FREE" money. Naturally, the crowd is more.

HOUSEMAKER

- In villages they usually get up early morning. To finish their routine work and to take care of their house members and non-house members such as goats, cows, hens, dogs, etc.—it takes some time **(Fig. 3)**.
- For such a long time pregnant ladies cannot withstand fasting.

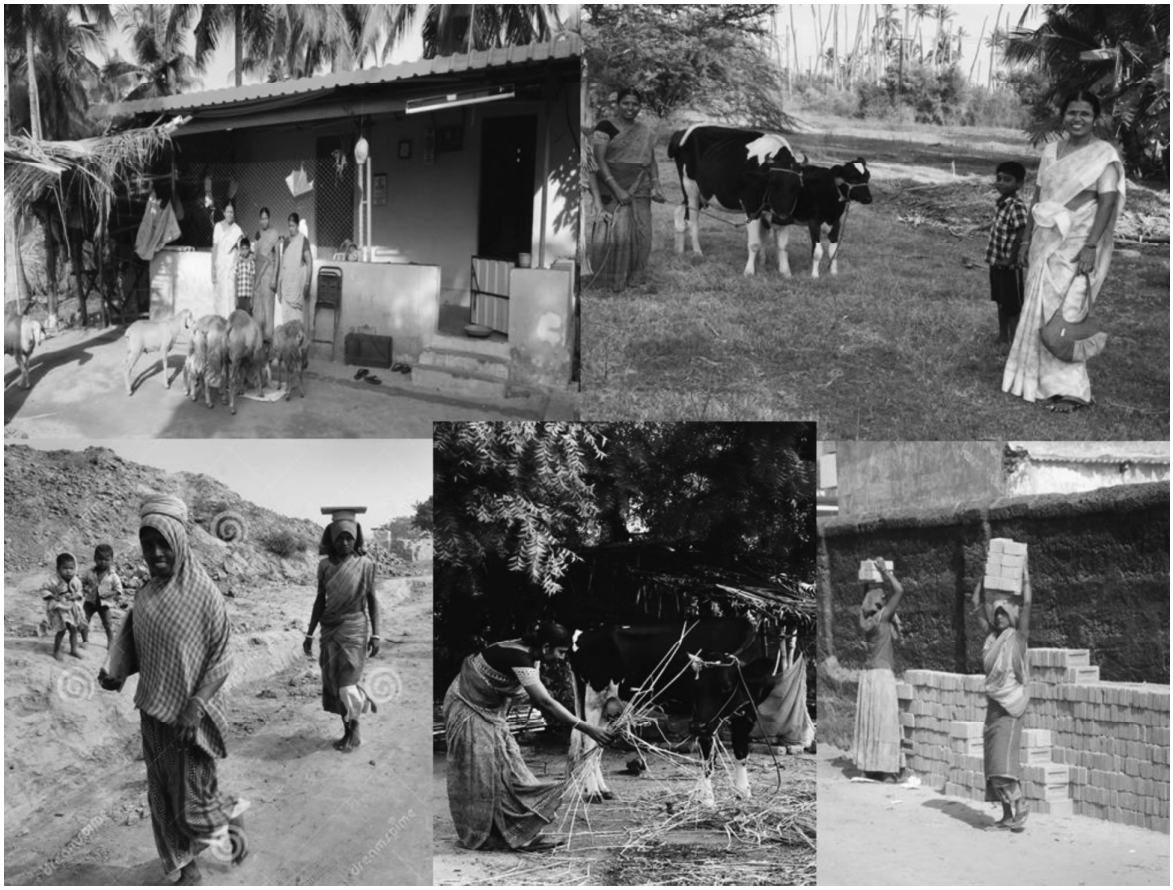

Fig. 3: *Housemakers in a village.*

TRANSPORT

They are from the interior of the villages where there is no transport facilities; they have to walk for at least 1–2 km to reach the bus-stop from their house **(Fig. 4)**.

Fig. 4: *People of the interior village walked 1–2 km to reach the bus-stop from their house.*

TIME FACTOR

- Walking for 30 minutes, travelling in bus for another 30 minutes to reach the PHC. Totally for coming to PHC may take for some people 2 hours also.
- All these depend upon the bus facility and frequency, which is available only at particular times of the day in rural areas. Also, government hospital Out Patient Department (OPDs) are not opened round the clock.
- So they all gather in the same time—morning, so it is crowded at PHCs.
- After reaching the PHCs, to see the "medical officer" it is another 1–2 hours. So, without GTT for normal visit itself it takes roughly 3–4 hours.

FAMILY BELIEF

- To do all these are difficult in fasting for pregnant females. They may easily faint. So, the elders in the house do not allow them without eating something in the morning.
- They strongly believe that pregnant women should not fast **(Fig. 5)**.

EARNING GONE

- These pregnant ladies are also daily wagers **(Fig. 6)**. They are accompanied by another earning member, because they cannot come alone during pregnancy.

Fig. 5: *Family belief towards the pregnant women.*

- For a single visit, two earnings are gone for a day. If she is asked to come again in fasting next day they do not turn out. There are many drop outs. In those, for GDMs, the delay can increase fetal mortality and morbidity.

LOW FASTING

In pregnancy fasting is always low because of heightened insulin sensitivity, muscle takes up more glucose, neoglucogenesis comes down, and less Hepatic Glucose Output . So fasting blood sugar is low.

EARLY KETOSIS

- Pregnant ladies are more ketosis prone because of accelerated starvation.
- In any pregnant female foetus is a continuously eating parasite in an intermittently eating host.
- She has to eat for two so she feels more hungry and early also.

HYPEREMESIS

- Since majority of pregnant ladies have hyperemesis, + the hyperosmolarity associated with GTT solution frequently leads to gastrointestinal (GI) intolerance with nausea and vomiting further. If they come in fasting they vomit, all efforts of coming in fasting for GTT become waste.
- So, pregnant ladies refuse to undergo GTT in fasting and tolerate glucose load better in non-fasting state and vomiting is also less. Hence, no necessity for repeating the test.

Increased Deliveries + GDM

We know that the number of deliveries also has increased on one hand, and GDM is also on the rise

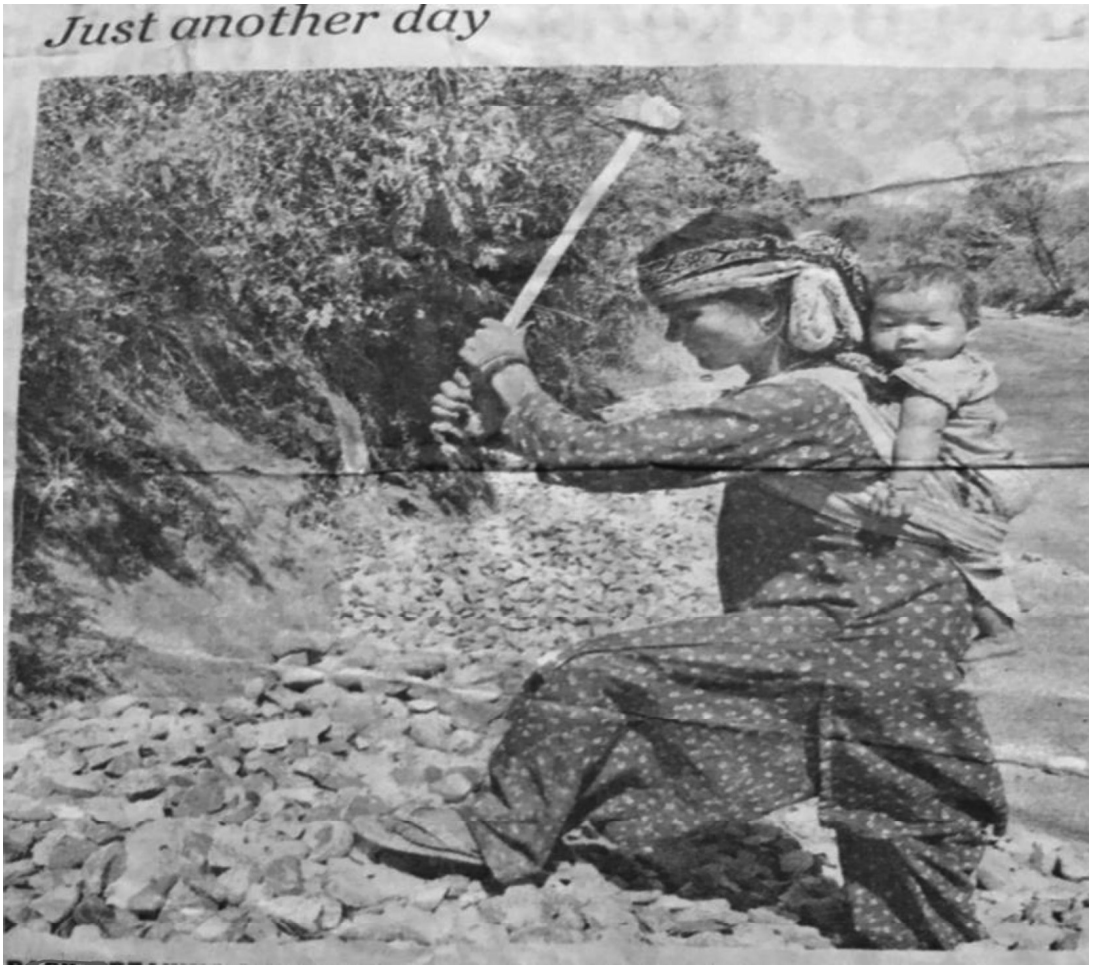

Fig. 6: *Back breaking labour: This woman in Jalandhar can hardly pause to celebrate May Day, a day for labourers, that falls on Sunday. A day's rest would deprive her of her bread and butter.*
Source: Press Trust of India (PTI).

on the other hand because of:

- our life-style
- Ethnicity, and
- Strong family history.

PREVENTION

So if we want to reduce the incidence of diabetes as such we have to focus on the pregnant mother, so that we can prevent diabetes in both the mother and the child by a single shot. For this, early diagnosis by simple screening is necessary.

NEED OF THE HOUR

Everybody in the Government Hospitals is over-burdened, he/she always wants and welcomes whichever is easier and simple, at the same time useful and prevents mortality and morbidity.

UNIVERSAL SCREENING

Indians are 11 times more prone to diabetes than Caucasians. Genetic predisposition, late marriages, unhealthy lifestyle, more polycystic ovary syndrome (PCOS), strong F/H, increasing incidence of GDM and diabetes, all these need early simple universal screening to diagnose GDM.

INDIAN PROBLEM NEEDS INDIAN SOLUTION

Solution

- Hence, due to all these practical problems they are not able to come in fasting.
- Our DIPSI (Diabetes In Pregnancy Study Group of India) solves the problem by that—glucose challenge test (GCT) *can* be done in fasting or fed state and fulfils the expectations of the International Federation of Gynaecology and Obstetrics (FIGO) and the World Health Organization (WHO), i.e., in low socio-economic countries . But in counties like us , they want to do something in pregnant women whatever they can depending on the resources available—to screen every pregnant woman for glucose abnormality becomes necessary to have diabetes free generation in future.

Diabetes in Pregnancy Study Group of India

- Diabetes In Pregnancy Study Group of India was started with the motto to prevent diabetes in the community by catching early as many GDM as possible with a simple screening test.
- After 10 years of implementing the DIPSI criteria, we evaluated the outcome in India by comparing the knowledge in 2005 and 2015 by the doctors and the patients about GDM.

Capacity Building [Knowledge, attitudes, and practices (KAP)]

- Medical officers
- Paramedical staffs
- Public

EVALUATION OF DIABETES IN PREGNANCY STUDY GROUP OF INDIA

We questioned 300 doctors who come for regular review meetings in different "health unit of districts" and about 500 patients who visit different PHCs **(Fig. 7)**.

This is done by simple three main questions asked:

1. Whom to screen for GDM?
2. When to screen for GDM?
3. How to screen for GDM?

RESPONSE: EARLIER

These questions were very much hated by patients and were much confusing for doctors. Doctors explained their difficulties of:

- Convincing the patient for 2 days and four vein drawn samples
- Facilities not available for such a long procedure + no manpower
- Difficulties in waiting in fasting for a long period and many more.

Response was very poor in 2004.

ACHIEVEMENT

- With DIPSIs easy single step procedure:
  - o Along with the improved, increased screening, and follow up, our aim is also coming true by reduction in bad outcome as macrosomia,

Fig. 7: *Evaluation of diabetes in pregnancy at the primary health care centre.*

preterm, pregnancy-induced hypertension (PIH), intrauterine growth restriction (IUGR), etc. Even the incidence of GDM is not increasing as we expected in last 10 years due to the increased awareness and more screening with easy simple procedure.

PROBLEMS

For the Pregnant Mother

- She is the housemaker, sometimes the bread winner.
- Has to get ready after caring the needs of the family members sometimes domestic animals.
- By this time she will be hungry and may not be able to attend ANC-OP in fasting state.
- Needs somebody to accompany—two wages gone.
- Distance to travel with less transport facilities.

Health Centres

- The centres open at 9–10 am.
- Staffs are not adequate.
- Huge population to take care.
- Sometimes pregnant women may not get the opportunity in one visit. If asked to come again she may not as she has to lose income for 2 days.
- ANC-OP is once a week. If she misses, she has to come after a week—enormous delay in getting the test done.
- Most of the laboratory is not well equipped and there may be deficiency in paramedical staffs.
- Continuous supply of electricity is a yet another problem.
- Many pregnant ladies do not come in fasting state due to lack of awareness and belief that pregnant should not fast for long hours.

Solutions

- Single step: Walk in test is the "best".
- DIPSI test can be done in fasting or non-fasting state, i.e., single step procedure recommended by our DIPSI and approved by the Government of India, WHO, and FIGO.
- Can use plasma calibrated glucometers recommended by the Government of India and the WHO.

ADVANTAGES

- The pregnant lady need not come in fasting state.
- Reduced vomiting.
- No drop outs, better turn out.
- Easy and economical
- Time saving
- No income loss for the patient and attender
- More pregnant screened and reduction in overall mortality and morbidity.
- Better outcome.