Nutritional management of diabetes in Africa the example of Mali

presented by
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1 – Match the recommendations to the local context in order to increase the observance of the « diets »

A – Analysis of the context

- Recording the main dishes eaten in Mali
- Food consumption survey was done by using the method of 24-hour recall on 80 diabetic patients in Bamako (capital of Mali)

- Results :

  - Breakfast

    - Porridge (based on different cereals like rice, millet, corn, etc)
    - Bread with butter or mayonnaise

  - Lunch

    - Cereal with different kinds of sauce

  - Dinner

    - Cereal with different kinds of sauce
    - Fries, salad, chicken etc

Food consumption of diabetic people doesn't represent any significant difference with the one of ordinary people studied by Mohamed Ag Bendesh in Bamako with the same methodology (Ag bendesh, 1996).

The difficulties of a nutritional approach in Mali

- Position in the family hierarchy to determine the content of the meals (influence of the big family)
- Difficulty to individualize the feeding (common dish)
- Difficulty to measure (eating with the hand)
- Influence of overweight and obesity prestige (particularly in married women)
- Difficulty to know the food composition (tagging)
- Eating in and out of the residence

B – « Study of the influence on the glycaemia of different cereals and sauces consumed in Mali »

- Methodology

  11 volunteers were recruited in the District of Bamako.
  People under medical prescription and people with diabetes were excluded.

  50 g of cereals were cooked :

  Fonio ► couscous.
  Rice ► white.
  Sorghum ► couscous and paste (Tô).
  Millet ► couscous and paste (Tô).
  Corn ►couscous and paste (Tô).

  Reference food was 100g of white bread equivalent to 50g of carbohydrate.

- And 5 sauces were studied :

  - Peanuts
  - Gumbo
  - Nadji (tomato)
  - Fakoye (green leaves)
  - Saga Saga (sweet patato leaves)

- After a 40-min cooking time, 12 cl of sauce was added to 50 gr of rice.

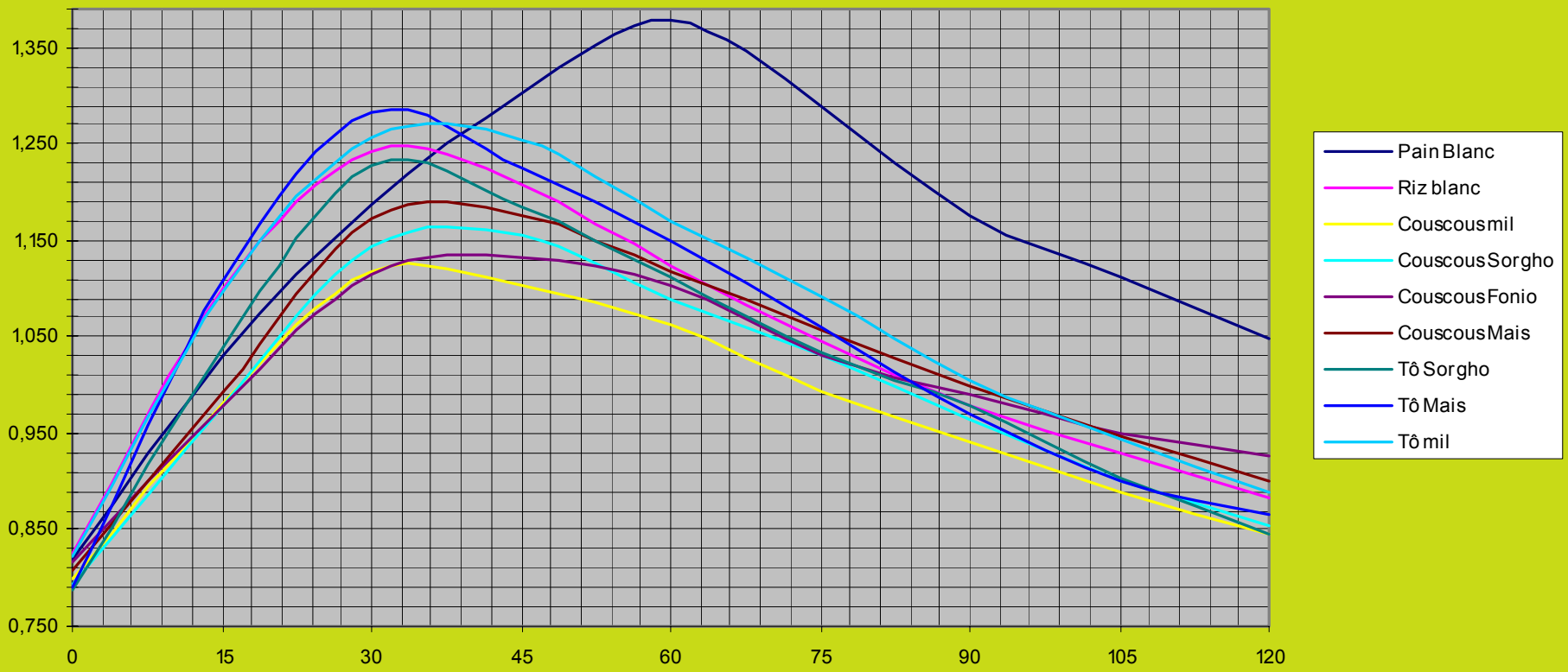
- Glycaemia at « T = 0 », was carried out before meal consumption.

- Blood samples were made at T = 15, 30, 45, 60, 75, 90, 105 and 120 min.

- Glycaemias were measured on capillary blood taken from the finger

- The area under the glycaemia curve was calculated in a geometrical way (FAO/WHO)

- Results « cereals »: evolution of the glycaemia at the different times of measure



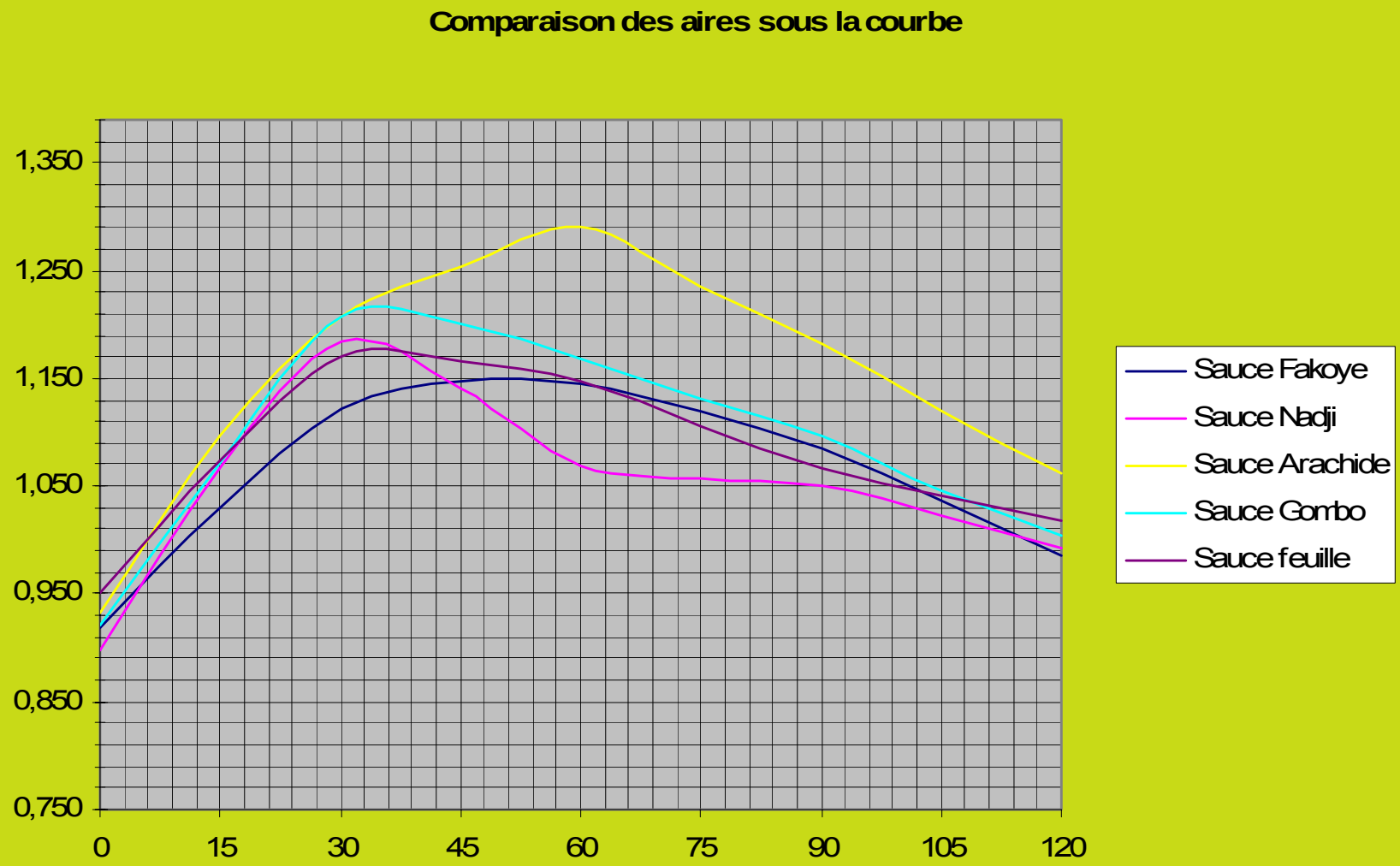
- Results « cereals »: evolution of the glycaemia at the different times of measure

Glycaemic index (GI)

Millet couscous	53,59 ± 7,13	Weak GI
Fonio couscous	56,95 ± 8,73	
Sorghum couscous	60,84 ± 6,24	Intermediaries GI
Corn couscous	64,47 ± 9,15	
White rice	66,40 ± 7,00	
Millet paste (Tô)	69,38 ± 5,55	
Sorghum paste (Tô)	73,84 ± 11,64	Elevated GI
Corn paste (Tô)	76,78 ± 8,28	

It’s preferable to privilege food consumption with weak GI (fonio and millet couscous) and intermediaries (sorghum couscous, white rice and millet tô) instead of elevated (sorghum and corn tô).

- Results « sauces »: evolution of the glycaemia at the different times of measure



- Results « sauces »: evolution of the glycaemia at the different times of measure

Sauces	Area under the curve (mmol/min/l)
Peanut	160 ± 28
Gumbo	126 ± 20
Nadji (tomato)	114 ± 35
Fakoye (green leaves)	108 ± 22
Saga Saga (sweet patato leaves)	96 ± 34

- The areas under the curve (AUC) of the gumbo, nadji, saga saga and fakoye sauces didn't represent any significant differences.

- The area under the curve of the peanut sauce presented significant difference with the areas under the curves of the other sauces tested.

« cereals » 3 main recommendations :

1) Food with low GI such as millet couscous and fonio couscous seem more appropriate for people with diabetes

2) As pasta, Tô should be less eaten in order to avoid too high elevations of the glycaemia.

3) No cereal are non-recommended, but certain cereals should be eaten with moderation.

«sauces» 4 main recommendations :

1) Peanut sauce, which presents an important hyperglycaemic effect, is not recommended for diabetic patients because of its biochemical composition rich in lipids, in simple sugar and causing a string energeticintake.

2) The Saga Saga sauce (high concentration of lipids and high calorie content) and Nadji sauce (elevated glycaemic proportion with a lot of simple sugar) do not have an ideal biochemical composition

3) The combination in preparation rice + gumbo sauce and rice + fakoye sauce are the most adequated because of weak AUC and good biochemical composition

4) When a meal contains Saga saga and peanut sauce, it is very important to use small quantities.

C – “Study of the impact of dietetic recommendations on patients glycaemia”

Methodology

Study population :

2 groups of 18 voluntary patients with diabetes have been recruited (group with education = Educated and group without education = Control) for the clinical follow-up protocol

Protocol :

One group has been submitted to a monthly education session whereas the other group has not attended a specific education session. At the same time of the research protocol both groups continued to do their “classical” consultations with their attending doctor.
The group submitted to monthly education sessions attended a steady education on the different points of diabetic patient education during 9 months (study time).

Methodology

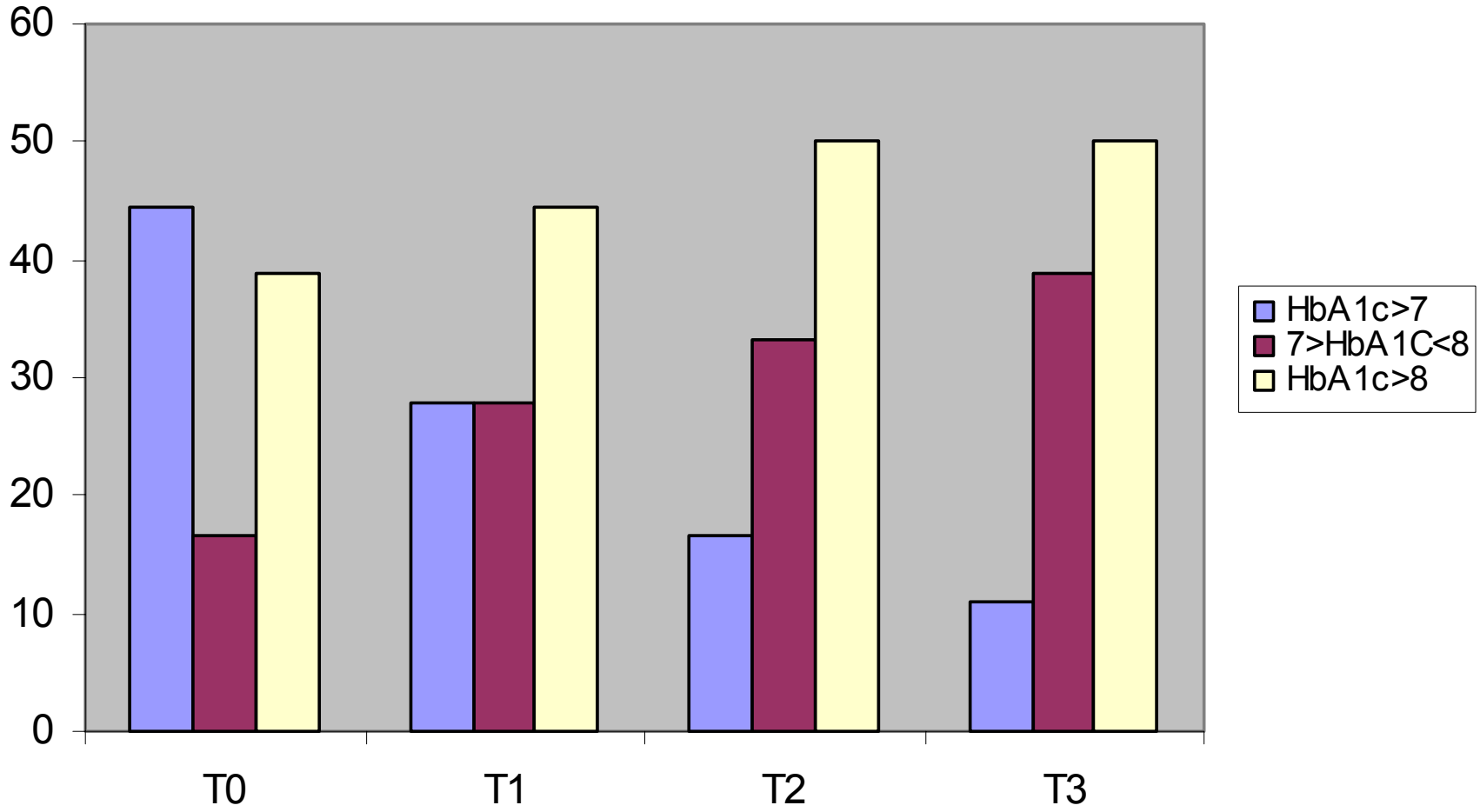
We used questionnaires that allowed us both checking patients knowledge and defining the content of education session.

We set up 4 knowledge groups (general points on diabetes, diabetic follow-up, lifestyle and dietetic measures, therapeutic programme) in order to assess the knowledge level of our patients and took 3 knowledge levels (good, medium and bad).

Subjects of the two groups have been tested 4 times during the 9-month study (T=0 measure, T=1 measure after 3 months, T=2 measure after 6 months, T=3 measure after 9 months).

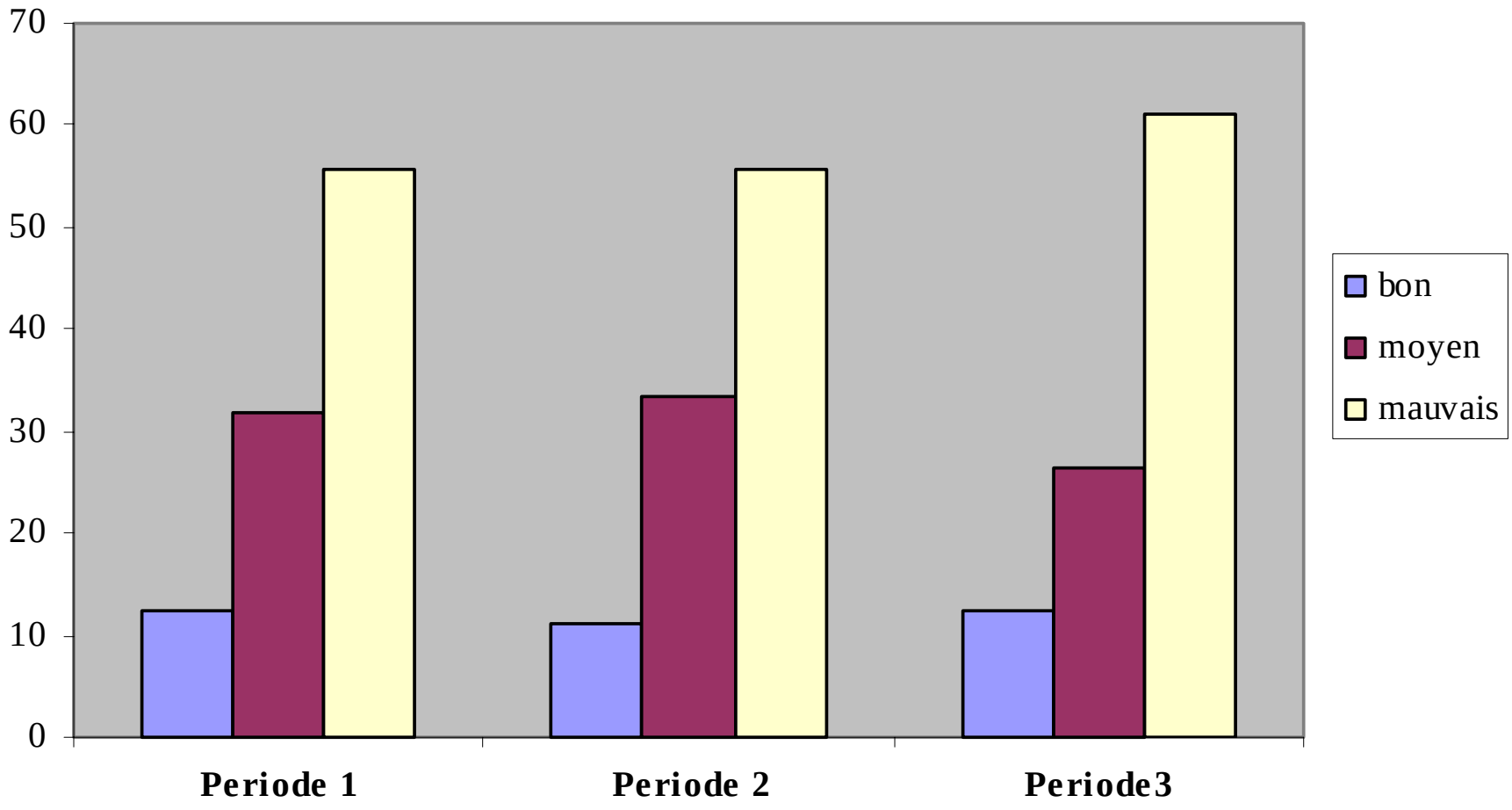
A blood collection has been carried out on patients in order to obtain a measure of glycosylated hemoglobin (HbA1c).

Results of the control group



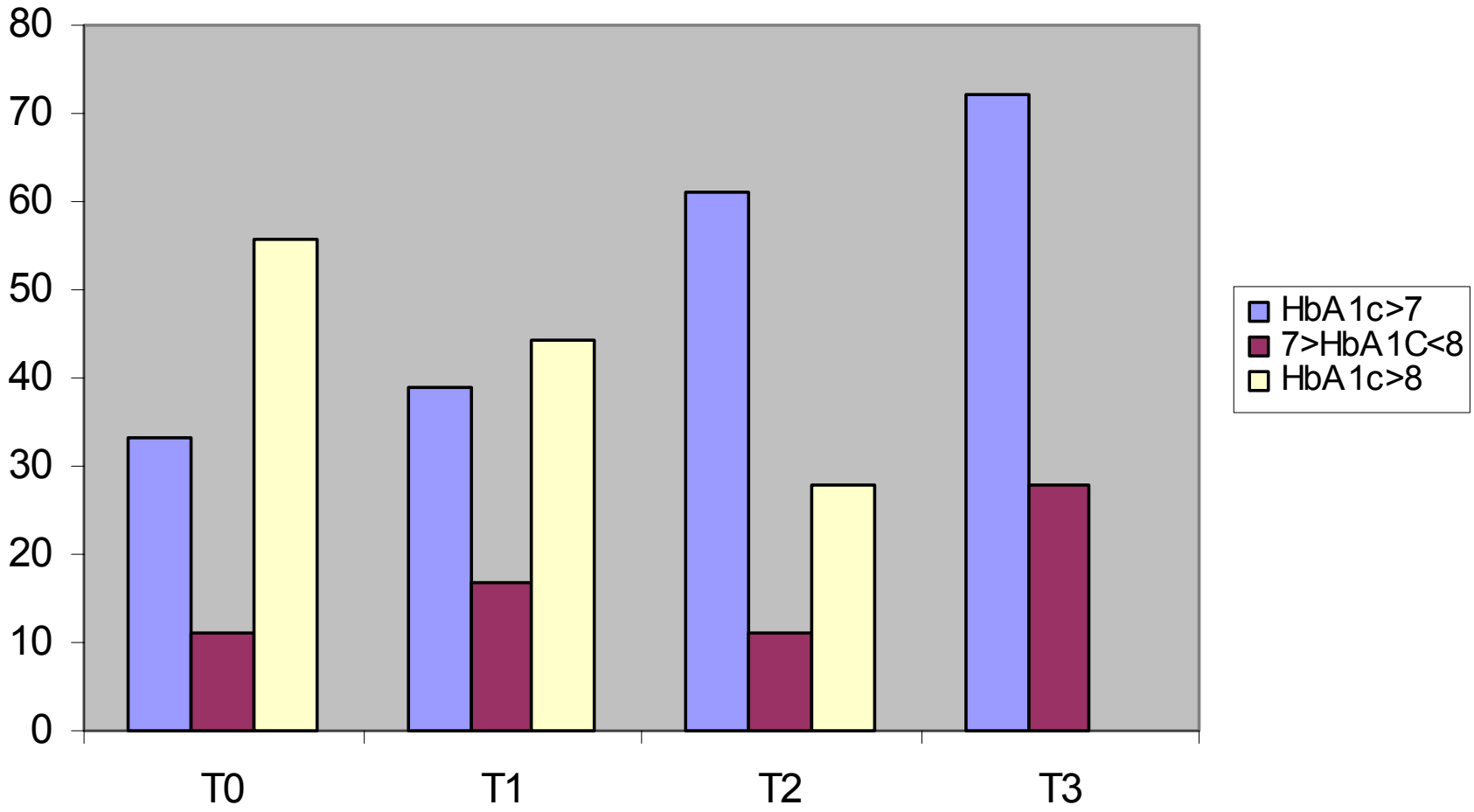
Graphic representation of glycosylated hemoglobin of the control group during the protocol

Results of the control group



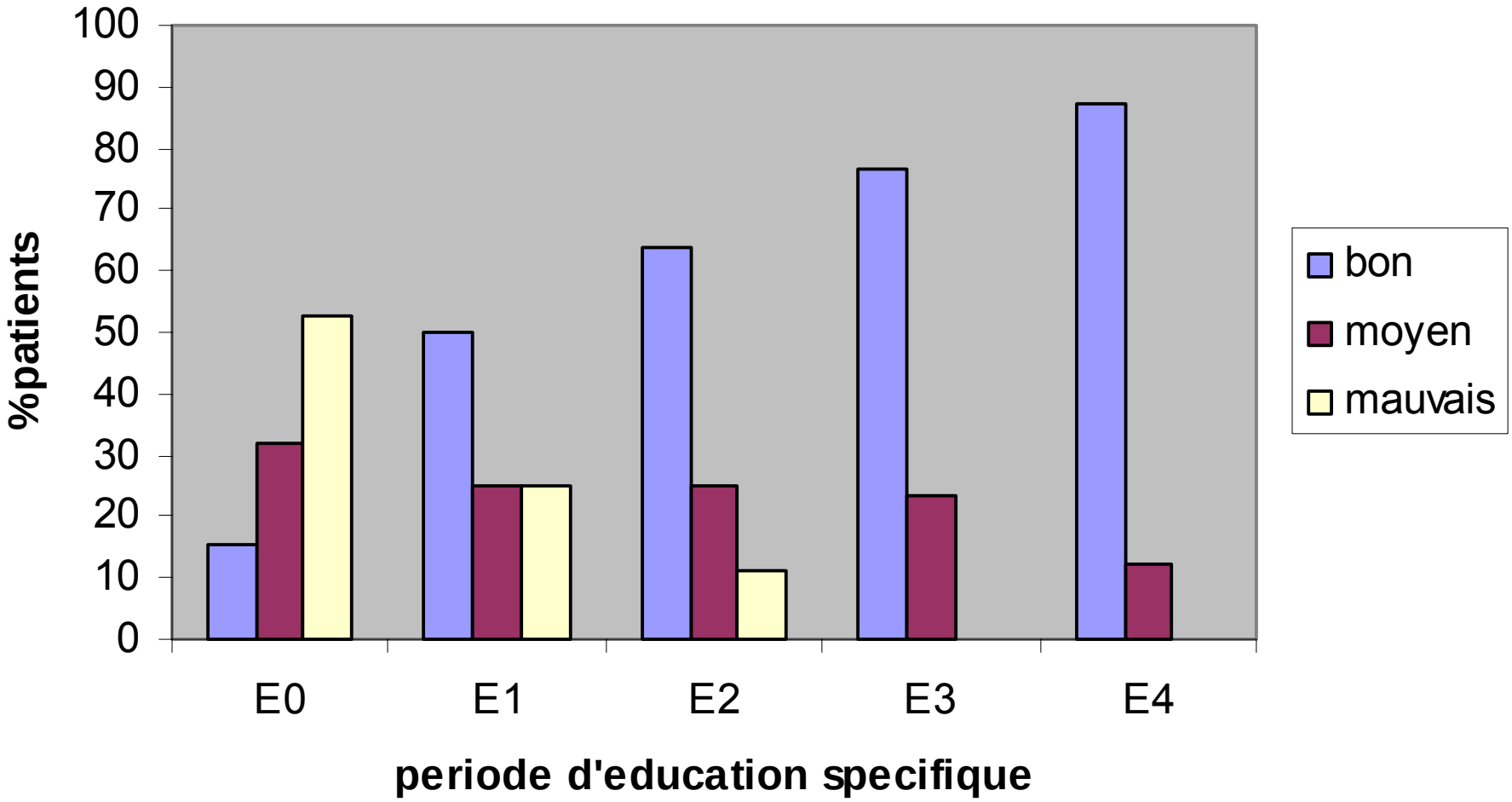
Graphic representation of the knowledge level of the control group during the protocol

Results of the educated group



Graphic representation of glycosylated hemoglobin of the educated group during the protocol

Results of the educated group



Graphic representation of the knowledge level of the educated group during the protocol

CONCLUSION

We found out the impact of the new dietetic recommendations:

- A monthly education session had a positive impact on the values of patients' HbA1c from the 3rd month. This impact significantly increased after the 6th and 9th month.

- Understanding and consent to the new dietetic recommendations have been underlying for obtaining glycemic balance of educated patients.

- Thanks to a specific therapeutic education, we obtained an important cut in HbA1c values and an improvement of diabetes balance which will allow a reduction in micro and macrovascular complications and a physical well-being of patients.

CONCLUSION

These conclusions allow us to propose 5 recommendations:

- *Consider therapeutic education as a non-separately activity of diabetes management. These therapeutic education programmes have to be continuous in time.*
- *Give to each patient minimum a one-hour education session per month in order to ensure a good compliance to instructions given by medical staff.*
- *Take into account new dietetic recommendations during education session.*
- *Enlarge therapeutic education to families and patients' environment.*
- *Build capacities of health care centres specialised in diabetes management, in setting up education units dedicated to diabetes.*

Acknowledgements to partners

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THANK YOU FOR YOUR ATTENTION