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The "Baependi Heart Study": the real history and the development of new strategies for health promotion in childhood education

O "Estudo do Coração de Baependi": a história real e o desenvolvimento de novas estratégias para a promoção da saúde na educação infantil

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Introduction

The "Baependi Heart Study" started with the Doctoral Thesis of Camila Maciel de Oliveira, in 2005, and it kept working with partnerships among some Universities in Brazil for research and outreach projects. In 2005, José Eduardo Krieger, Alexandre Costa Pereira and Camila Maciel de Oliveira started this pioneer journey in the Laboratory of Genetic and Molecular Cardiology that takes place at the Heart Institute (InCor) at the University of São Paulo (USP). More recently, our group had the opportunity to start projects to discuss some of the cardiovascular risk factors and their prevention among childhood education in Minas Gerais State (Baependi and Juiz de Fora) and Parana State (Curitiba).

Why was Baependi considered a desirable choice?

The "Baependi Heart Study" started with the Doctoral Thesis of Camila Maciel de Oliveira,[1] in 2005, and it kept working with partnerships among some Universities in Brazil for research and outreach projects. In 2005, José Eduardo Krieger, Alexandre Costa Pereira and Camila Maciel de Oliveira had started this journey in the Laboratory of Genetic and Molecular Cardiology that takes place at Heart Institute (InCor) at University of São Paulo (USP).

The real history is that Baependi was not the first choice to host the project. At first the study would be in another town near Baependi called Pouso Alegre, Minas Gerais State. It was not possible to develop this project in Pouso Alegre because this kind of study requires a political support, which we did not have there.

Baependi is a place to live a quiet life, a small town in the Southern part of Minas Gerais State with happy and welcoming people. There are 19,000 inhabitants in an area of approximately 281 square miles. The economy is based in agriculture, craftwork and tourism because of 55 waterfalls, "Forró" (a typical dance) on Saturdays and Sundays night, and religious tourism (a saint named Nhá Chica who lived there).

Baependi had all the requirements, being the political support included as one of them. Other relevant factors in Baependi supported this choice, as for instance the following: there were many large families, and this is good for some of the genetic studies.

The migration in this town is not significant. It is easier to invite patients to participate in this kind of studies in a small town when compared to a big city. There was political support - the city hall would give us the infrastructure, logistics and even financial support. So Baependi ended up being the right choice.

What were the challenges?

Even though we had all the support we needed in Baependi, there were some challenges we needed to deal with: (1) in this kind of epidemiological projects, we would have to run it in a large group of volunteers. Then, fifteen students from *Faculdade de Medicina de Itajubá* (in English, Faculty of Medicine of Itajubá) were part of the research staff; (2) Baependi population uses to be resistant to outsiders' projects (this may be a peculiar behavior, typical of some little towns); (3) we had a short deadline to finish the project; (4) we had to organize a Heath Center from the scratch in 2 weeks to start working. The study protocol was approved by the Ethics Committee of the *Hospital das Clínicas*, USP, Brazil (SDC: 3485/10/074), and each participant provided written informed consent before participation.

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Methods

How did everything happen?

In a brief time, only two weeks, from November 15th to December 3rd, it was necessary to organize the Health Center, work on the street to fill the family structure questionnaire (Day 1), organize the database (Day 2), train the medical students (Day 3). Then, in the fourth day we started to attend the participants and we kept doing that for the next two weeks in December and other two weeks in January.

The day before going to the streets we defined a territory of study using the official town map. The houses being part in the study had been randomly chosen within an area as shown in ***Figure 1***.

First Day: During the first day we had to train the staff, which was composed of health agents and volunteers from the local community. Also during the same first day, we sent them to the houses around study. For each family they fulfilled a questionnaire to know the family structure and they invited the first-degree relatives of each visited family.

Second day: Harvested questionnaires which were the source of the database.

Third day: Training the medical students and doing the organization of the serum bank.

Fourth day: We were finally ready to welcome our patients, but we were still afraid. We did not know if the patients were interested in the "Baependi Heart Study". We were waiting, and they arrived! The reception office was full most of the time. And the line went on all day long. The Medical students filled the questionnaire with the patients and helped with the physical tests. The breakfast was successful.

Challenges have never ended: Baependi has a very large rural area and we had to pick up patients' relatives that live far from downtown. Sometimes we had to go to where the patients lived. In the laboratory, the blood tests were done, and the serum bank was organized. We had lots of work to do and much trouble to deal with, but we were happy.

Results

In 4 weeks (two weeks in December 2005 and two weeks in January 2006), we could gather 1,720 patients, a total of 121 families, in a range of 3 to 156 patients per family (***Figure 2***).[2-7] When compared to other international studies, it is a significant sample. Some days we attended more than one hundred patients. Data were updated daily. The average amounted 428 patients in a week.

In the first wave we did the genetic mapping, laboratory tests and some specific tests, in 1,712 patients. After five years, we had the second wave of the "Baependi Heart Study" in the same Health Center (***Figure 3***). After four years the second wave, we got more space and a Medical doctor to attend the high-risk population and to be available to solve doubts about the tests results.

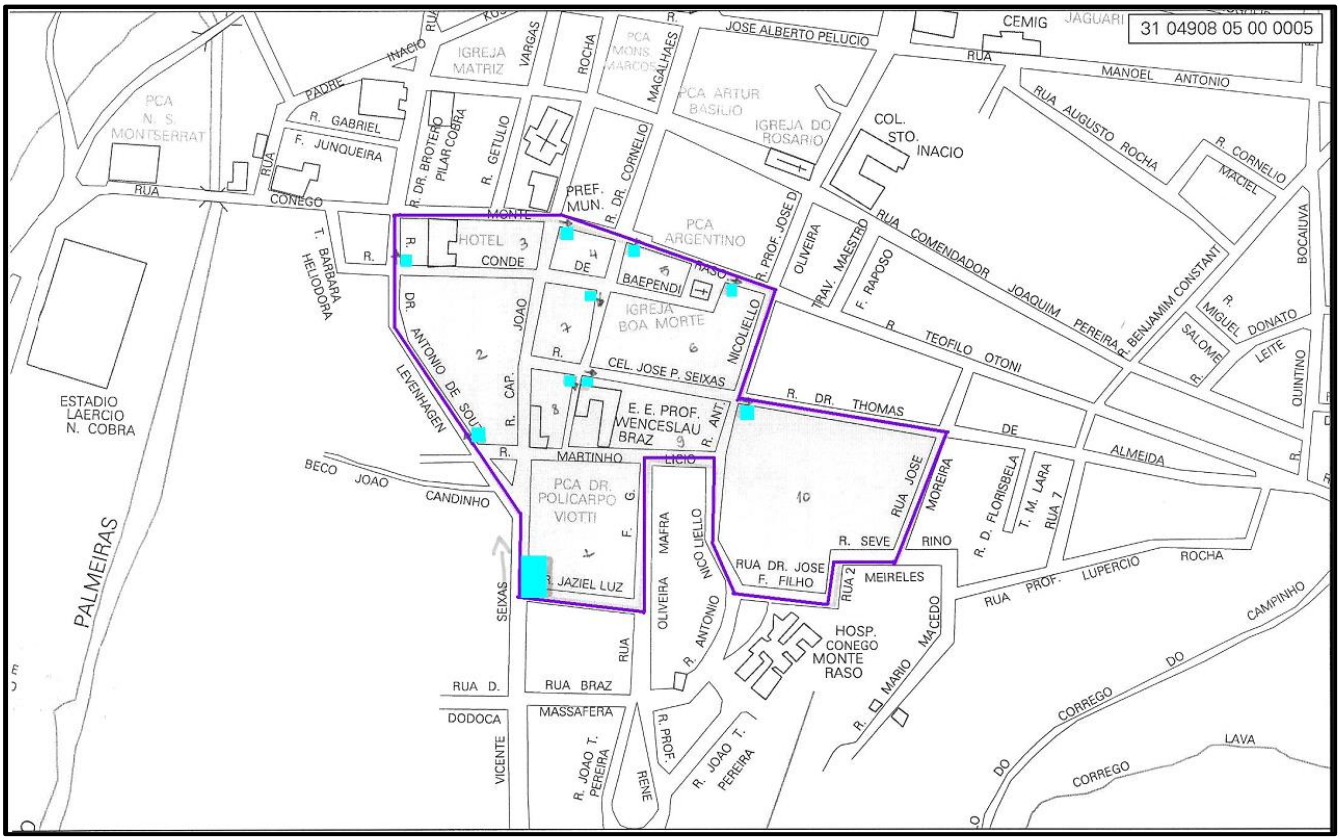

Figure 1. Defined a territory of study using the official town map. The houses being part in the study had been randomly chosen within this area.

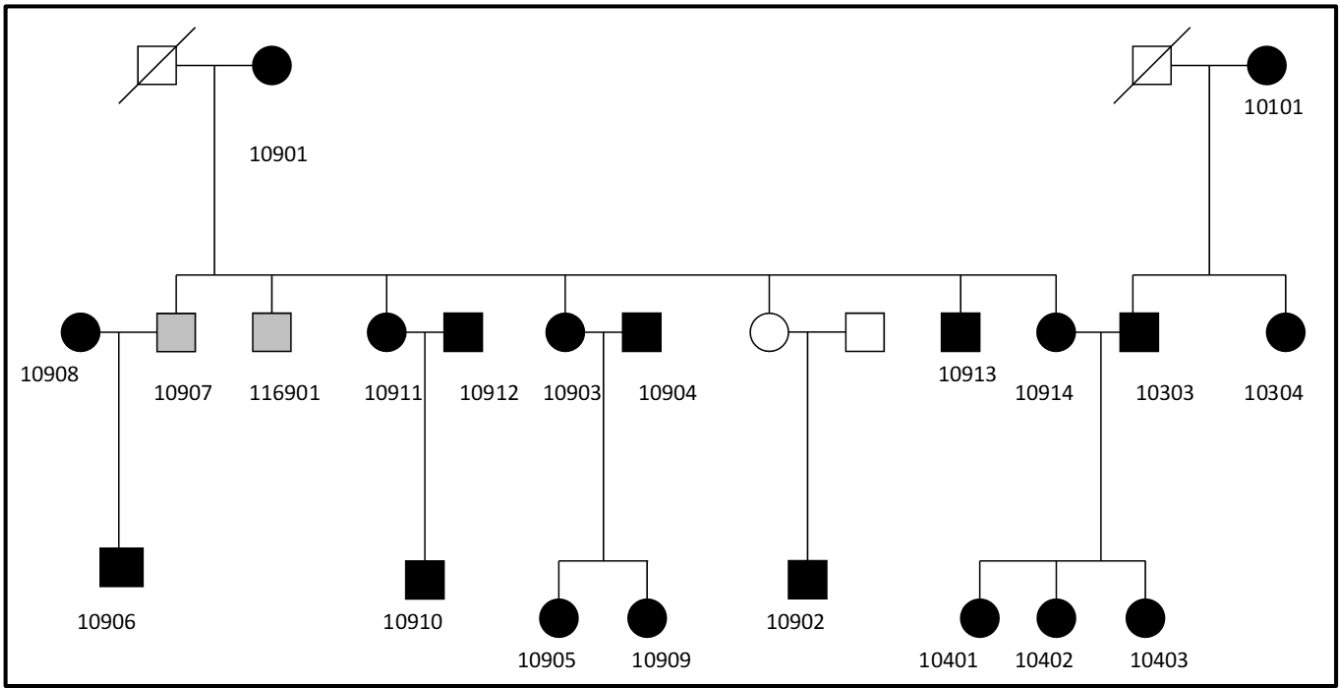

Figure 2. Example of heredogram of Family 10 in Baependi sample.

We compared the difference between the tests done in the first wave with the second one. In the second wave,[8-10] five years later, we included many specific tests, and we were working in a sample of 2,528 patients (***Figure 4***). Ten years later, in March 2016, the third wave of the "Baependi Heart Study" has started.

Why talking about prevention and health promotion for children?

Some professors from *Universidade Federal do Paraná* (UFPR) and *Universidade Federal de Juiz de Fora* (UFJF) started another kind project and it could not be more promising because it covered children and adolescents, called the "Baependi Little Heart" Study. The results of this study are reported elsewhere.[11]

This group was Prof. Camila Maciel de Oliveira, Prof Carlos Alberto Mourão Júnior and Dr. Rafael de Oliveira Alvim. This new Project involves plays using puppets to teach about healthy lifestyle and prevention of chronic diseases. It is a low-cost project because we just need the methodology, puppets and a frame with a curtain.

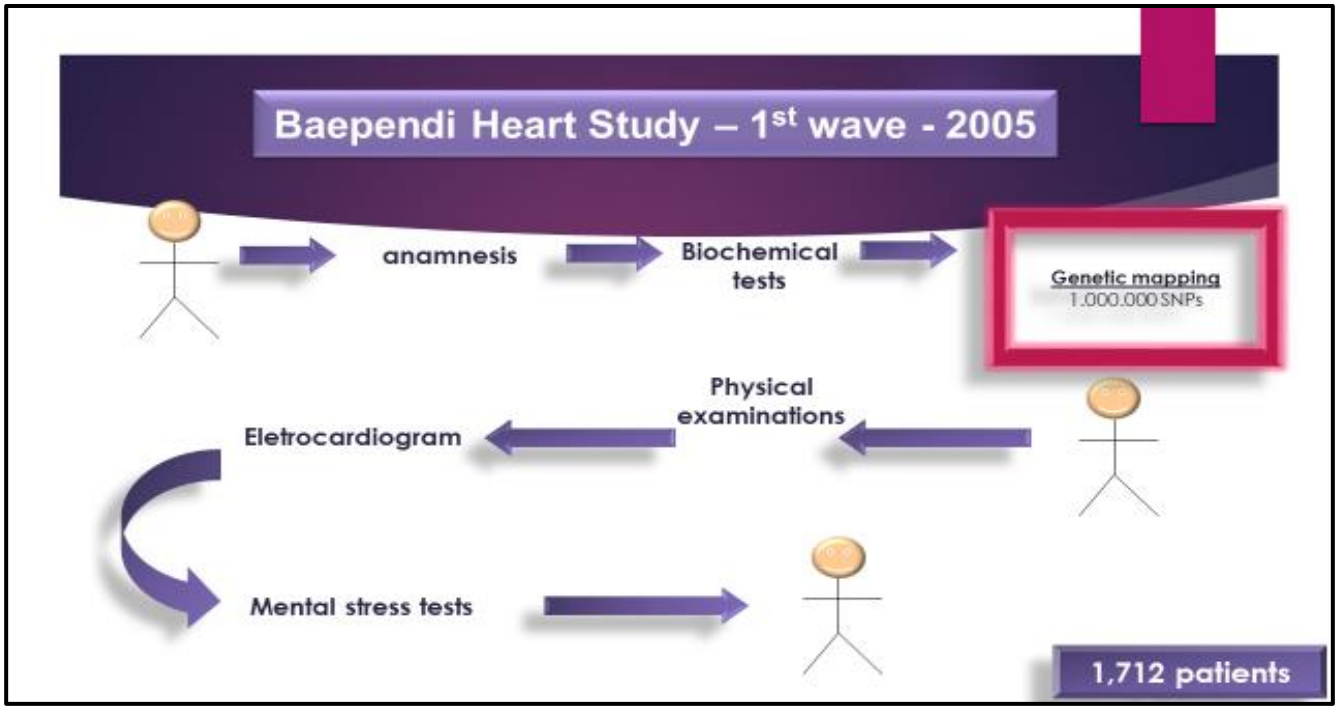

Figure 3. First wave of the "Baependi Heart Study".

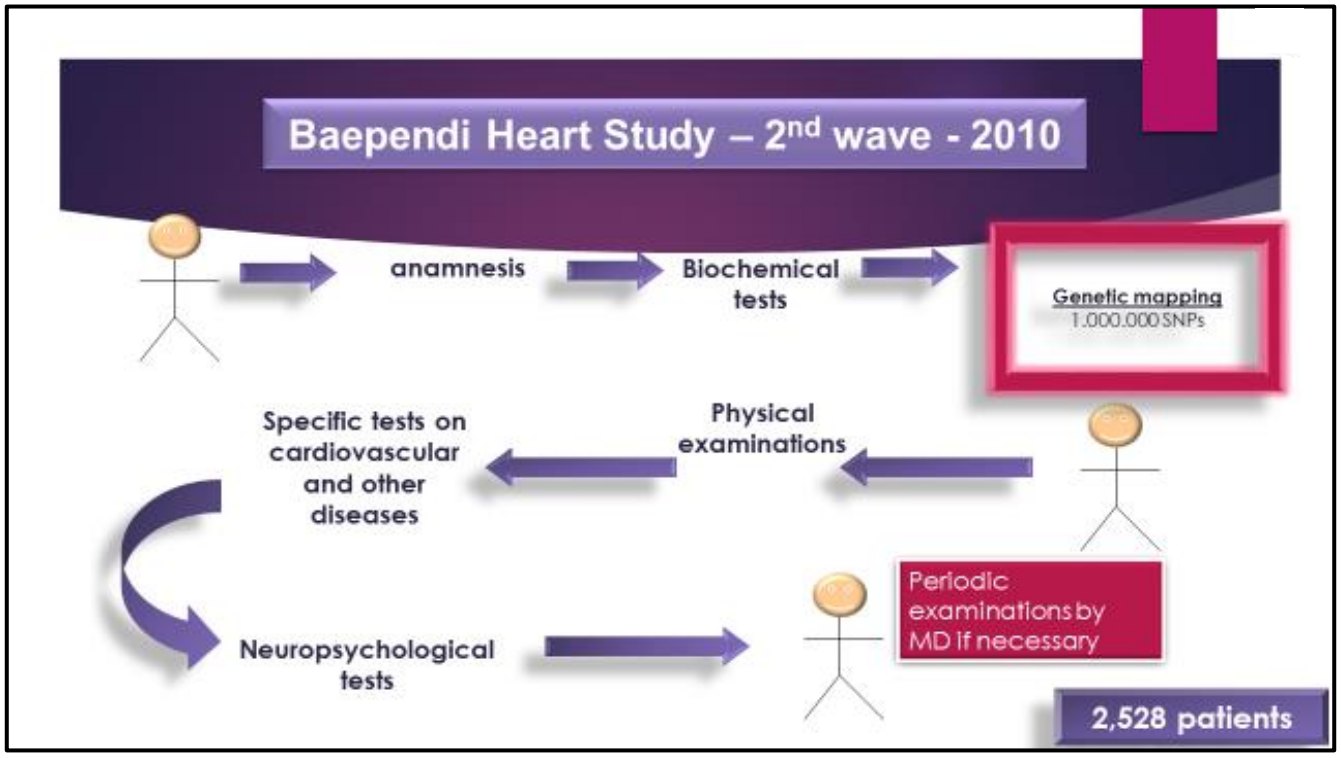

Figure 4. Second wave of the "Baependi Heart Study".

It was important for the development of this project the effort of each student that lives in Juiz de Fora and takes 3 hours by bus to get Baependi and works there for 3 consecutive days trying to make the puppets plays for 900 children each time that they go to Baependi town. About 20 students of Medicine, Dentistry, Nutrition, and Nurse kept this project since March 2015 to March 2017.

In 2015, our group had started training teachers of county and state Schools, in Curitiba. Our goal is encouraging the teachers to let the students be the active part in the play presentation. It had been also presented these plays for Special Education Schools. The children and adolescents were very excited about this specific methodology and almost 10,000 children have been watched the plays in a year.

The answer for the question above is: we believe that children can take the seeds for inside their homes and teach their parents about prevention of diseases, healthy life style and health promotion.

Conclusion

The "Baependi Heart Study" is the first cohort involving familial design in Brazil. This project may answer some interesting questions related to cardiovascular disease, among others. In addition, after this initial idea, other projects have been spreading health promotion methodologies for other populations, one of them, for Brazilian immigrants living in the United State of America.

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