APITHERAPY PILOT STUDY - HOW TO REDUCE RISK FOR VIRAL INFECTIONS BY STRENGTHENING THE IMMUNE SYSTEM IN PRESCHOOL CHILDREN

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Abstract: *Preschool children have a low immune system if they do not have a proper diet and lifestyle, also supplements with bee products can help as well. In order to support children's immunity, we took into consideration a natural honey-made product for children to be consumed and monitoring their health status. Aim: To increase the immunity of preschool children from Târgu-Mureş city / Romania, after consuming a mixture of bee products. Materials and methods: We made a pilot study, based on questionnaire survey along with an experimental method, applied to a group of 18 children, during 6 months, from cold to warm seasons. The experimental part was based on a supplement bee product made by a mixture of honey, pollen, propolis, royal jelly and apilarnil made from carefully selected ingredients. This cocktail was taken daily by each child before breakfast and lunch, one teaspoon, twice a day. We applied a lifestyle questionnaire to the children's parents in three steps: at the beginning, after 3 months and at the end of our study. Results. Frequency of most usually illnesses registered during cold season in our group has decreased: respiratory viral diseases decreased by an average of 5.55%, laryngitis by 2.22% and flu by 3.41%. Two third (66.66%) of children's parents who took the cocktail thought that it had a good effect on their immunity system, 11.11% of them thought that it had not any effect. These data showed that the impact of bee product treatment was positive, also parents (especially those with higher education) were open to this intervention and also were the children, and it was an accessible and easy to use intervention with good results. Conclusion. We recommend a balanced diet with many fresh fruits and vegetables, as well as daily exercise and natural food supplements like bee products, to prevent viral diseases and to avoid excessive drug treatments.*

INTRODUCTION

For a good health status, it is very important to ensure children's menu with various foods, that fit their needs that have all the basic nutrients plus vitamins, electrolytes and salts that organism requires. They need to eat as many fruits and vegetables as they can, especially fresh ones, because they contain vitamins, fibres that assure a good intestinal transit and a good digestion, also proteins, vitamins and bioactive elements that are essential for their immunity.(1-6)

The apiarian products can help the immune system, also the mixture of these products has a synergistically effect. Researchers recommend children to eat honey, pollen, propolis, royal jelly and bee larvae, in quantities prescribed by specialists, specific like they are or mixed into apiarian cocktails.(7-9)

The modern trend is to use natural products for prevention effects, as well as base for medical treatments, in order to increase therapeutic arsenal, and fast assimilation of nutrients.(10-13) Our mix of apiarian products -APIARIAN COCKTAIL- was obtained by combining: honey, pollen, propolis, royal jelly, bee larvae, in different quantities for personalized recipes. These products do not have side effects, except for people that have allergies to one or more of its components. Also, these cocktails can be improved with volatile oils or plant parts (roots, leaves, fruit, flowers, seeds).(14-16) With help of inhalers and special distributors, specialists recommend also aromatherapy. A new trend is hive air therapy, that means inhalation of vapours from the hive, with the help of a special device, without getting in contact with the bees, and without any stings.(6,17)

Preschool children can have a low immune system if they do not have a proper diet and lifestyle. In order to help the children's immunity, we took into consideration a natural honey-made product for children, to supplement their menu.

PURPOSE

Our aim was to increase the immunity of preschool children from Târgu-Mureş city / Romania, after consuming a mixture of bee products for 6 months.

MATERIALS AND METHODS

Hypothesis: If one teaspoon of apiarian cocktail will be added before breakfast, and another one teaspoon added before lunch in children's daily menu, immune system activity will increase the fight against viruses that can cause respiratory viral diseases, laryngitis or flu.

The independent variable: Introduction of nutritious supplements in children's daily menu.

The dependent variable:

- The children's availability of eating the supplement twice a day, every day;
- The parents' consistency of daily administration;
- The quality of the product;

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- The storage conditions.

The sample data: This pilot study group consisted of 18 children (from which 55.55% were girls) that initially were tested with a questionnaire about the frequency of illnesses and the administered drugs in the last year, followed by the application of apiarian supplements for 6 months, then questioned again about their health status (after 3 and 6 months) to compare data.

The location was no. 15 Kindergarten from Târgu-Mureş city, and the experiment took place between December 2016 and June 2017.

The used methods were:

1. *The experimental systematic observation* – it was an experiment which provided precise and objective data. The *independent variable* represented the cocktail applied, and the *dependent variable* represented decreasing of illness frequency. The proposed natural experiment offered to participants' possibility to test apiarian product without changing anything in their lifestyle, behaviour, or daily program. Only 2 children did not consume the product: one had general allergies and the other one did not like the taste from the beginning and refused it.
2. *The qualitative research based on the questionnaire* – this prospective survey started with permission from the Ethics Committee of the University of Medicine and Pharmacy of Târgu-Mureş city and from Administration Board of the Kindergarten no. 15, also the parents' written approval, then each parent was told to complete a questionnaire three times (at starting point, another one after 3 months of treatment and the third one after 6 months).

Research instruments used:

The questionnaires were designed to collect general information about lifestyle (diet, frequency of eating specific foods etc), as well as attitudes regarding the apiarian cocktail for their children.

The anamnesis was made on personal discussions with parents.

Working steps:

Pre-test - Before the intervention, parents answered a questionnaire about their children's lifestyle characteristics. By analyzing the results we concluded that most of families had an omnivore diet, no child suffered of diabetes or high level of cholesterol, they were pretty interested into having a healthy diet, and they consumed foods from all main groups (dairy, meat, eggs, vegetables, fruit, nuts but also sweets and natural juice). The consumed fat was butter and vegetal oils, they ate white bread, rarely integral or polenta, they put spices instead of salt in cooked food, and they drank enough water every day. Children ate breakfast every day at kindergarten, sometimes they ate snacks between main meals. They eat out in an average of once a month. The parents were concerned with their children's weight and they considered that children's current weight reflects what they eat. Children were sleeping an average of 9 hours every night, also each day after lunch at kindergarten, they spent 2-3 hours a day outside, and some of them practiced different kinds of sports (swimming, basketball, or dance).

Experimental step - At the beginning of December, the study started by giving each children 2 teaspoons of mix supplement, daily, one before breakfast and one before lunch. The supplement contained honey, pollen, propolis, royal jelly, and bee larvae.

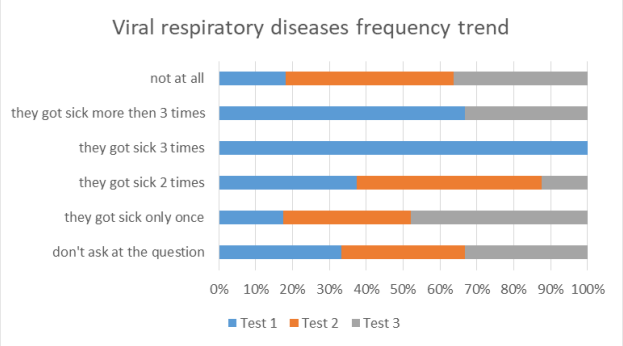
Post-test – Parents completed a second questionnaire twice: after 3 months and after 6 months after the experiment (regarding their lifestyle, frequency of children's respiratory diseases and impact of this experiment).

Based on our results we want to extend this pilot study at national level, with a program focus on representative communities and evaluation of apiarian cocktail on children's health and nutritional status, and parents feed-back.

RESULTS

Frequency of viral respiratory diseases in our sample after the experiment, highlighted the fact that we registered an improvement of the immunity status of these children with 40.00%; 11 children (61.11%) got sick only once from the beginning of winter, 4 children (22.22%) did not get sick at all and 2 children got sick 2 or 3 times, compared to last winter, when 3 children got sick 2 times, 6 children got sick 3 times, and 2 children got sick more than 3 times (and this winter none) (figure no. 1).

Figure no. 1. Frequency of respiratory viral diseases in our sample



The frequency of respiratory diseases by laryngites, during this study, highlighted the fact that the number of children that got laryngitis just once stayed the same (5), and number of children that did not get sick at all increased from 9 to 11 (from 50.00% to 61.11%), with good outcomes (figure 2). In addition, number of children that did not get any flu increased from 50% to 61.11%, since last year's data.

Figure no. 2. Distribution of laryngitis frequency in our sample

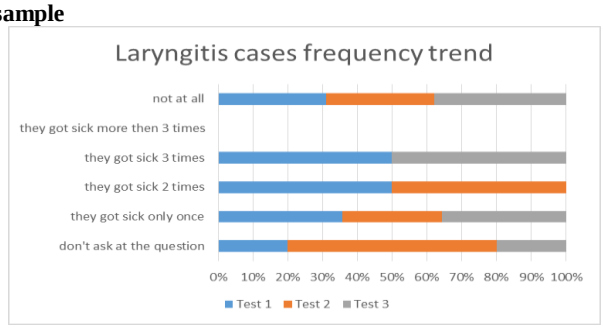
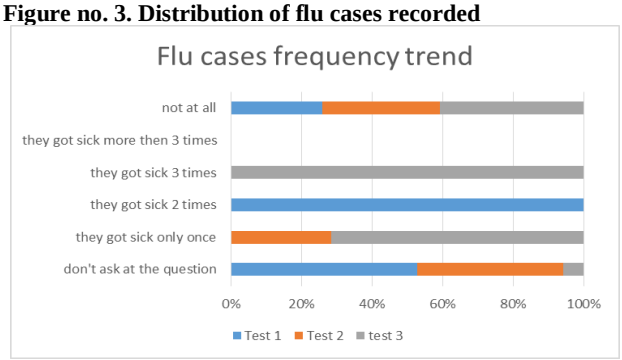
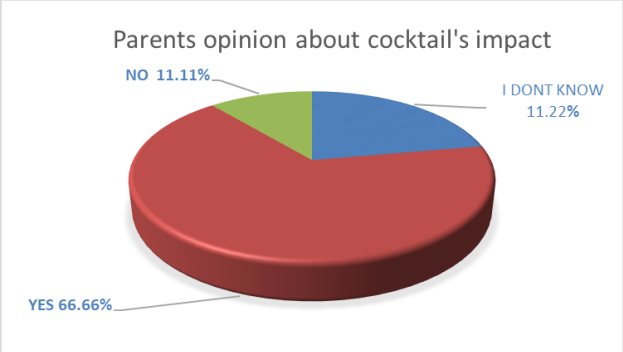


Figure no. 3. Distribution of flu cases recorded



Parents' feed-back at the question: Do you think that administration of this product to your child, has increased the immunity system and decreased the frequency of respiratory diseases? were: 66.66% said YES, 11.11% believe NOT, and 22.22% didn't answer (figure no. 4).

Figure no. 4. Parents' opinion regarding the effects of apiarian cocktail upon their children



These data showed that impact of this bee product treatment was positive, also parents (especially those with higher education, $p<0.002$) were open to this intervention along with the children, and it was an accessible and easy to use intervention.

These results proved that there is a positive connection between consumption of apiarian products and children's immunity system (see our results SWOT analysis in table no. 1), anyway further studies are required, with more specific interventions.

Table no. 1. Intervention SWOT analysis

Strengths	**Weaknesses**
✓ This is a quality product, IBA certificated ✓ Its administration was done under control ✓ Parents had an open mind and answered the questions sincerely ✓ Trust for the apiarian products has increased	✓ Children's allergies ✓ Children haven't done medical analyses before and after the consumption of the product
Opportunities	**Threats**
✓ This research offered the apiarian products' certainty of value	✓ Intervention of other consumed and unreported products

DISCUSSIONS

Family doctors and pediatricians are often facing an increased incidence of respiratory infections, of superior tracts (pharyngitis, laryngitis, sinusitis, rhinitis) or of broncho-pulmonary tracts (bronchitis, tracheitis, pneumonia) that can become chronic and can influence the children's growth, especially in frequent relapses. In cases like this, the apitherapy has numerous solutions for improvement or even for cure.(18-20)

A study done in Turkey, at the Ozal Turgut from Ankara, showed that there is an urgent need to find the best standardized mix that has to be approved for benefic effects for health, like propolis, royal jelly, Echinacea, focusing on the improvement of children's immunity system.(21)

Over 34 million people in entire world live with the virus of the Human Immunodeficiency Virus (HIV) and recent studies from Medicine University in St. Louis showed that bee venom (its main component being melitinis) was capable of destroying the cells and the unhealthy tumours caused by viruses like HIV.(22)

A group of Japanese researchers have done a double-blind randomized study with 2 samples, controlled with placebo. 61 healthy subjects were selected randomly in a study group that got royal jelly (31 people) and a control group (30 people). 3000 mg royal jelly or placebo in 100 ml of liquid/day were taken for 6 months. After 6 months, they found out that the erythropoiesis, the glucose tolerance and mental health were improved.(21,22)

In our country, specialist like Mateescu and Abalaru have done a series of studies on Romanian apiarian products, highlighting therapeutic qualities of it. Apiarian cocktails are true "health springs" by their content in vitamins, minerals and other microelements, with good results against many illnesses. These cocktails are helping organism in fighting against fatigue, stress, unhealthy diet, or pollution. Nutrition concepts have extended from surviving and hunger satisfaction to prevention of side effects, focusing on using the good food to improve the quality of life and to reduce risk of acute diseases. In order to have a healthy status it is necessary to have a more efficient approach towards functional foods in nutritional science.(23-25)

Our results proved, like similar studies, that there is a connection between consumption of apiarian products and improvement of immunity system of children, and based on these outcomes we recommend a following personalized interventions to be made.(26-28)

CONCLUSIONS

Consumption of apiarian products 2 times a day in a therapeutic dose can increase outcomes of immunity system against viruses that cause respiratory diseases, and our body can be stronger and healthier.

We recommend a balanced diet with many fresh fruits and vegetables, as well as daily exercise and natural food supplements like bee products, towards to prevent viral diseases and also to avoid excessive drug treatments prescribed for these illnesses.

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