

## CASE REPORT

# A Novel Treatment for Microcephaly: A Case Report

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## ABSTRACT

**Background:** Although not too rare, microcephaly remains incurable. In the case that a treatment can improve the status of these patients, that will be novel.

**Case presentation:** A 6-month-old boy presented with a head circumference small for his age, confirmed by a pediatric neurologist, was our case. Before and after study imaging and other evaluation tests done for the baby. In this study, we used an ointment made from camel hump, gout's rump, walnut, hazelnut, and almond to treat this condition. After 15 months of applying the ointment, the patient's head circumference as well as his development such as ability to speech, walk, hearing, approached normal. He could walk and his hearing and speech ability dramatically improved. The components of the ointment influenced the growth of the bones and development of the brain and fontanels.

**Conclusion:** This method is a practical method for treatment of the microcephaly in the way that can treat the patients behavioral, mentally and physically

**Keywords:** Microcephaly, gout's rump, walnut hazelnut

## INTRODUCTION

With an incidence of one in every 30,000 live birth, microcephaly, defined as a head circumference 3 SD lower than the mean head circumference for age, is an uncommon incurable disease<sup>1</sup>. Some researches indicated that physical activity could positively affect the epiphyseal growth<sup>2</sup>. There are also some researches which concluded that pressure can also affect the epiphyseal growth<sup>3</sup>. Walnut, hazelnut and almond have had significant effects on the brain development, bone formation and anti-oxidation<sup>6-13</sup>. Globally, there is 1 case of microcephaly in 30000 babies at the time of birth<sup>4</sup>. As the microcephaly has no treatment, it is not a rare disease among babies; it causes many burdens on the community, including cognitive problems; and the patients and their families will be isolated in the community; therefore, we aimed to find a new treatment for these babies.

## CASE PRESENTATION

The case was a 6 month old neonate referring to the physician with chief complaint of small head circumference. With 2800g weight, APGAR 9/10, and head circumference(HC) of 30cm at birth and 31 at 6 months old. Sucking, grasping and moro was good and his pattern of crying was abnormal. His posterior fontanelle was closed, but the anterior one was open in the size of a tip of finger. He had abnormal face features and the neck holding status was negative. In para-clinical findings, lab data was not abnormal, brain CT showed open sutures at birth and MRI Indicated the microcephaly and small corpus callosum. EEG was normal, whereas the auditory brain response (ABR) showed a decrease in hearing bilaterally. All of his blood factors normal. The immunological evaluation of the baby for Toxoplasmosis, rubella and CMV was normal. All the results and experiments were confirmed by a pediatric neurologist to have microcephaly. By the examination of

the baby and his mother accurately, infection, exposure to toxic chemicals, genetic problems and malnutrition rolled out for causes microcephaly.

Fig.1: Pre-intervention X-rays Motahari Clinical, Shiraz, Iran

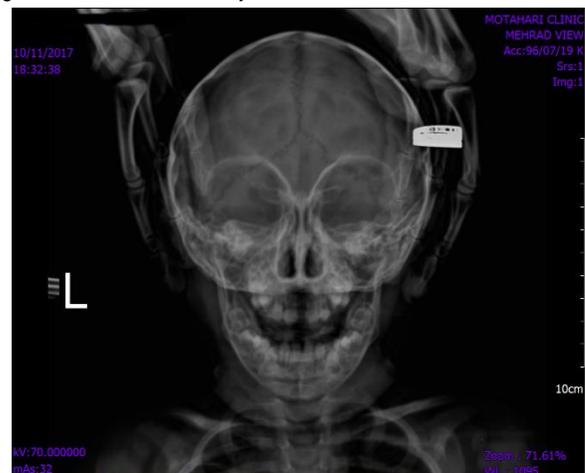


Fig. 2: Pre-intervention X-ray Motahari Clinical, Shiraz, Iran



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Fig. 3: Post-intervention X-ray Motahari Clinical, Shiraz, Iran



**Study medication:** We made an ointment which was a mixture of camel's hump, goat's rump, walnut, hazelnut and almond oil. The ointment was mixture of 150 g goat's rump, 100 g camel's hump, 5 piece of walnut, hazelnut and 20 cc of almond's oil.

**Drug administration and intervention:** First visit: At the first visit by the physician, the baby was 6 months old. The ointment was administered on the head of the baby for 2 hours every day on all of his fontanel (ant fontanel) by massaging. This massage was done by a resident of traditional medicine who is completely familiar to kinds of massage. This procedure continued for 3 months. From this to the second visit, the baby underwent a cupping procedure 1 time per month on his occiput. The cupping is believed to highly affect the growth of the bones<sup>5</sup>.

Second visit: The baby was visited for the second time at the age of 9 months old. After physical examination, we added some nuts such as walnut, hazelnut and almond to the daily feeding of the mother and previous treatment of the baby continued exactly such as the first visit.

**Third visit:** At this visit, the baby was 12 months old. We stopped the treatment on both mother and baby and waited for 3 months to have better evaluation about the effect of the drug on the baby and his mother.

**Fourth visit:** At 15 months of age, the baby was evaluated physically, mentally, behaviorally through imaging.

**Confounding factors:** The only confounding factor in our study was that the baby was administered sodium valproate due to his seizures. He was breastfed and he and his mother were controlled not to use any drugs after his birthday and during the intervention except for the supplements and ointment. All circumstances were controlled.

## POST-ADMINISTRATION EVALUATION

**Physical examinations:** By using drugs for 6 months, the results were dramatically changed. The head circumference increased from 31 to 36 at the third visit. The improvement of the hearing sense was good enough to put the hearing aids away. The exophthalmia vastly improved and the face feature of the baby approached the normal status. At the third visit, we stopped the treatment, and the results showed that we had just 0.5cm increase in HC. Behavioral evaluation at the fourth visit revealed that the baby could walk quite normally. The baby could say some words such as "MAMA" or "GAGA". His ability to speak

more meaningfully was improving. His overall appearance was not abnormal anymore.

**Imaging:** The imaging clearly showed that the circumference of the head increased dramatically. This increase was not as the normal growth of the head for this interval.

**Maternal lab data:** The lab data of the mother was checked both before and after the intervention to ensure that mother did not have any metabolic disorder. The result reported by the physician, testing the metabolic factors, showed that the mother did not have any metabolic disorder to cause microcephaly as its complication. Also, after the mother used the supplements all of the tests remained normal.

## DISCUSSION

Overall, the components of camel's hump, goat's rump, walnut, hazelnut and almond improved the brain's development and growth of the bones. The baby had significant improvement in his behavior, body and in hearing skills. The idea of this study inspired by Iranian traditional medicine and specifically by Avicenna.

It is believed to walnut have a role in maintaining the brain's health; also recent studies showed antioxidant effect of walnut on the human's body<sup>6,7</sup>. Walnut is applied with honey and has a common rule in tortuosity of the nerves<sup>8</sup>.

Pilat et al. found that almond can inhibit the osteoclasts so that they can function in formation and expression of the genes less<sup>9</sup>. Also, some studies showed that it can improve the cognitive functions and decrease the inflammation<sup>10,11</sup>.

New studies indicated the effect of hazelnut on the brain and spinal development, specifically during pregnancy<sup>12</sup>. This material can also decrease the oxidative state of the body<sup>13</sup>. This substance is oily and slow to digest. Hippocrates says that it leads to the growth of the cerebral matter<sup>8</sup>.

Fat is a well-known substance. Camel's hump and goat's rump are both types of fat. Camel fat is useful for convulsions. Fumigation with hump of a camel is used for beneficial effect in piles. Goat fat is useful in conditions of inter-intestinal irritations. It is also useful in the ulcer of the intestine<sup>8</sup>. So that with these information about the materials which used in the drug the mechanism of drug will be understandable.

There was no relevant study for to be compared with our results or discussed, but some effects of these substances have been confirmed by the researches mentioned above with similar effect, as we expected. More researches is needed to investigate the effect of these supplements separately so we have more insight about its effect on microcephaly.

## DECLARATION

The consent form of ethics of Shiraz university of medical science signed by the father of the patient.

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