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The Experience with the Use of Nandrolone Decanoate and Pyritinol in Children with Cerebral Palsy

Aamir Jalal Al-Mosawi^{1,2*}

¹Advisor in Pediatrics and Pediatric Psychiatry, Children Teaching Hospital of Baghdad Medical City, Iraq

²Head, Iraq Headquarter of Copernicus Scientists International Panel, Baghdad, Iraq

*Corresponding author: Aamir Jalal Al-Mosawi, Advisor in Pediatrics and Pediatric Psychiatry, Children Teaching Hospital of Baghdad Medical City, Head, Iraq Headquarter of Copernicus Scientists International Panel, Baghdad, Iraq

Abstract

Background: Cerebral palsy is a heterogeneous disorder resulting from a non-progressive damage to the developing brain that cause mostly a variable degree of chronic motor disability and developmental abnormalities during early childhood including delayed speech and motor development. Because of the heterogeneous nature of the condition and variable severity and presentations, patients are generally treated with an individualized treatment plans that provides a combination of interventions including treatment of spasticity with muscle relaxants and physical therapy. Patients with severe condition can have significant disability, while patients with less severe disorder experience delay in motor developments and learning difficulties. The aim of this paper is to describe retrospectively our experience with use of nandrolone decanoate (ND) and pyritinol in children with a less severe form of cerebral palsy with aim of improving motor functions and learning abilities.

Patients and Methods: Five patients (3 males and 2 girls) with cerebral palsy presenting mainly with spasticity, hyperreflexia and delayed speech and motor development. The patients were treated with intermittent low dose intra-muscular (i.m) injections of ND (12.5 mg for children under 2 years, 25 mg for the older child) with the aim of improving their delayed motor development. Pyritinol was used in the one patient in addition to ND with aim of improving his learning abilities. Estimation of the bone age was made using radiographs of the left wrist before the injection and 2 weeks after each injection. The patient was monitored weekly for the development of hypertension and sign of virilization. All the patients had normal or delayed bone age before treatment.

Results: The use of nandrolone decanoate intramuscular injections and pyritinol was associated with dramatic effect on the motor development and learning abilities respectively without the occurrence of any adverse effects. Mild advancement of bone age was noticed only in one patient.

Conclusion: nandrolone decanoate and pyritinol can be useful in the management of cerebral palsy.

Keywords: Cerebral palsy, Development, Nandrolone, Pyritinol.

Introduction

Cerebral palsy is a heterogeneous disorder resulting from a non-progressive damage to the developing brain that cause mostly a variable degree of chronic motor disability and developmental abnormalities during early childhood including delayed speech and motor development. Because of the heterogeneous nature of the condition and variable severity and presentations, patients are generally treated with an individualized treatment plans that provides a combination of interventions including treatment of spasticity with muscle relaxants and physical therapy.

Patients with severe condition can have significant disability, while patients with less severe disorder experience delay in motor developments and learning difficulties [1-3]. The aim of this paper is to describe retrospectively our experience with use of nandrolone decanoate (ND) and pyritinol in children with a less severe form of cerebral palsy with aim of improving motor functions and learning abilities.

Patient and Method

Five patients (3 males and 2 girls) with cerebral palsy presenting mainly with spasticity, hyperreflexia and

delayed motor development. Three patients aged 14 months (patients 1, 2, and 2), one patient aged 13 months (Patient-4), and one patient aged 9 years. Patients 1 and 2 had poor sucking and feeding during the first week of life and developed physiological jaundice, and the mother

Table 1: The patients' characteristics and clinical findings before treatment.

Age/Sex/Etiology	Before treatment	Other notes
(1) 14-month Male Birth asphyxia	Delayed speech; not saying any word with meaning. Unable to turn from the supine to the sitting position alone. Unable to maintain sitting position when he was put in the sitting position. Not crawling but occasionally rolling to the sides. Mild spasticity & hyperreflexia. Good fine motor skills with good pencil grasp and eating biscuit alone.	Has 3 healthy siblings aged 3, 4, and 6 years. Social smile before 12 weeks of age. Head control was not achieved until 1 year of age.
(2) 14-month Female Undetermined etiology	Spasticity, hyperreflexia, and mild reducible equines deformity. She was crawling, but had poor head control when pulled to the sitting position, and was not sitting alone. Fine motor skills with good pencil grasp and eating biscuit alone. Delayed bone age: Wrist radiographs showed only 2 bones.	
(3) 14-month Female Birth asphyxia	Good fine motor skills with good pencil grasp and eating biscuit alone. Mild spasticity & hyperreflexia. Roll from supine to prone position but was unable to sit alone. Not crawling and had poor head control.	3-year old healthy brother. Non consanguineous parents.
(4) 13-month Male Undetermined etiology	Sitting for about 1 minute and crawling. Brisk reflexes.	
(5) 9-year Male Birth asphyxia	Tendon reflexes were brisk. Weakness of the lower limbs more marked on the left. Walk for about 20 meters before needs rest. Walk upstairs with difficulties and holding the bars. Unable to stand on one foot. Feeding independently. Joined primary school 3 months before referral, but failed to learn, and was unable to draw a circle.	Consanguineous parents. 3 sisters aged 3.5, 6, and 12 years with normal development. Walked at the age of 4 years. Marked growth retardation: Weight 20.2 kg & height 121 cm. Had left squint associated with hypermetropia that was corrected by glasses.

of patient 2 had Mother was anemic during pregnancy & received intramuscular iron and antibiotics for gynecological infections.

The patients under two years had delayed language development and were not saying any word with meaning. Three of patients under two years had good fine motor movements as indicated by good pencil grasp and eating biscuit alone. The condition in three patients was related to birth asphyxia, while two patients were considered to have cerebral palsy of undetermined etiology. None of the patients had family history of any neurological disorders. Table 1 summarizes the patients' characteristics and clinical findings before treatment. The patients were treated with intermittent low dose intra-muscular (i.m) injections of ND (12.5mg for children under 2 years, 25mg for the older child) with the aim of improving their delayed motor development. Pyritinol was used in the older patient (Patient-5) in addition to ND with aim of improving his learning abilities. Estimation of the bone age was made using radiographs of the left wrist before the injection and 2 weeks after each injection. The patient was monitored weekly for the development of hypertension and sign of virilization. All the patients had normal or delayed bone age before treatment. All the patients had normal brain CT-scan. Signed consent was obtained from parents/guardians prior to enrollment and the study was approved by the Scientific Committee of Iraq Headquarter of Copernicus Scientists International Panel.

Results

The use of ND and pyritinol was associated with dramatic effect on the motor development and learning abilities respectively without the occurrence of any adverse effects. Mild advancement of bone age was noticed only in one patient. Table 2 summarizes the treatment of each patient and their effects.

Discussion

The cautious and judicious, but safe use of nandrolone decanoate has recently been reported to have some benefit in the treatment of patients with cerebral palsy, refractory vitamin D-resistant rickets, and achondroplasia. In contrast to 17- testosterone derivatives, nandrolone esters do not cause sodium sulfobromophthalein retention; therefore hepatic complications are infrequent with their use in ordinary doses for short periods. The use of nandrolones has been reported to be associated with beneficial positive effects such as muscle strengthening.

Table 2: The treatment of each patients and their effects.

	Treatment	Effects of treatment
Patient-1	2 i.m injections of nandrolone decanoate (ND) 12.5 mg within an interval of 2 weeks.	Dramatic effect on the motor development without the occurrence of any adverse effects. After 1 week, he was able to sit alone and tried to stand. 1 week after the 2nd injection, he was walking holding furniture confidently, and walking 1-2 steps alone. The motor improvement was sustained at 8 weeks after the second injection. Liver enzymes showed no significant change before and 4 weeks after treatment. Neither hypertension nor any sign of Virilization has been observed during 4 weeks of weekly follow up. Stimulation of growth was observed.
Patient-2	Oral baclofen 2.5 mg daily. 3 i.m injections of ND 12.5 mg within an interval of 4 weeks.	After the third ND injection the girl was sitting alone for 15 minutes. After the 2 nd ND injection, wrist radiographs showed only 2 bones. Neither hypertension nor any sign of virilization during 6 weeks of weekly follow up.
Patient-3	2 i.m injections of ND 12.5 mg within an interval of 2 weeks.	1 week after the 2nd ND injection, she was sitting alone and has good head control. 2 weeks after treatment bone radiographs showed mild advancement of bone age with presence of 4 bones at the wrist.
Patient-4	1 i.m injections of ND 12.5 mg	2weeks following ND injection he was sitting indefinitely and stands holding furniture.
Patient-5	Oral pyritinol 100mg once daily during the first week, increased to twice daily from the second week. Three 25 mg i.m injections of ND every 5 days. The mother was instructed to intensify her effort in learning him drawing a circle, square and the alphabetical letters.	After 4 weeks of treatment, he was able to walk for more than 10 minutes without resting & learned to draw a circle, square & the Arabic alphabetical letters.

The intermittent judicious use can help in avoiding the main risk of premature epiphyseal closure and any possible unnecessary virilization. Nandrolone is less virilizing than other anabolic steroids and have been used in women. In contrast to 17- α testosterone derivative, nandrolone esters do not cause sodium sulfobromophthalein retention; therefore hepatic complications are infrequent with their use in ordinary doses for short periods [4,5]. It has been shown that cerebral blood supply is increased by pyritinol resulting in an improvement of nerve cell metabolism, and it was used with benefit in idiopathic mental retardation [6]. Successful management of difficult neurological disorders demands careful balancing of the possible unwanted side-effects associated with persistent injudicious use as it may be useful to obtain the benefits of such agents through appropriately skilled use.

Conclusion

The use of nandrolone and pyritinol in this study was found to have a beneficial effect on motor development without the occurrence of unwanted effects or advancement of bone age.

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*Corresponding author: : Aamir Jalal Al-Mosawi, E-mail: almosawiAJ@yahoo.com

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