

## 論文要旨等報告書

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| 学位論文題名  | The relationship between functions of body balance and occlusion in childhood (小児における咬合機能と身体平衡機能の関連性に関する研究) |
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### 学位論文内容の要旨

The relationship between occlusal condition and general condition of the patient has become the focus of various reports. Among these, there are several reports Regard occlusion and body equilibrium function. In particular, the presence of body sway in a standing erect posture has been considered to strongly reflect equilibrium function. There have been many studies on the relationship between body physical function and occlusal function in adults, but studies on children are few. Most physical and occlusal function develops during childhood. Thus, researches of the relation between these functions in deciduous dentition are necessary.

The purpose of this study is to confirm whether there is a relation between occlusion and body posture from childhood, and to check the relationship between occlusal balance and body sway during the deciduous dentition and mixed dentition

The relationship between children's deciduous dentition and mixed dentition period occlusal balance and body's sway was studied. The participants of this study were 128 children with Hellman's Dental Age II A stage ( average age of 4.5 )at a nursery school and 56 children with Hellman's Dental Age III A stage (average age of 8.1) at a elementary school. The distance and the area of gravity center movement (GCM) when the participants had their eyes-opened and eyes-closed were measured with automatic posture analytical devices (Patella® VTS-311 EGG2000v system).

Occlusal abilities including occlusal contact area, average pressure, maximum occlusal pressure, occlusal force and occlusal balance were measured with the Dental Prescale® system. Analysis of occlusal balance was determined by separating the middle group ( $|x| \leq 5\text{mm}$ ) from the deflection group ( $|x| > 5\text{mm}$ ) based on the position of occlusal balance center. Both of the deciduous dentition and the mixed dentition. A significant difference was found between the occlusal balance of the middle group and the occlusal balance of the deflection group in the distance and area of gravity center movement with eyes-opened and closed. The distance and area of gravity center movement of the middle group was less than that of the deflection group.

Analysis of body balance was determined by the good balance group, normal balance group and bad balance group based on the GCM area with eyes-closed. A total of all children GCM area of eyes-closed were able to complete the exercise. The first 25% of the participants with the best balance were grouped as the good balance group; and the last 25% with the worse balance were grouped as the bad balance group. Both of the deciduous dentition and the mixed dentition. A difference was found between the good balance group and the bad balance group in the occlusal contact area and occlusal force. The occlusal contact area and occlusal force of good balance group were more than the bad balance group.

#### 【Summary】

There was a significant relationship between the functions of body balance and occlusion in childhood, including deciduous dentition and mixed dentition period. The influence of occlusal balance on body balance is much stronger and obvious than the influence of body balance over occlusal balance; occlusal balance can influence body balance most of the time, while body balance can sometimes influence occlusal balance. A relation exists during Hellman's Dental Age II A and III A period. It was difficult to find any relation before Hellman's Dental Age II A period, and also it was difficult to confirm any relation during unstabilized dentition period, such as Hellman's Dental Age II C and III B.

## 論文審査結果の要旨

本研究は、小児期における咬合機能と全身機能の関連性を検討する目的で、成長発達指標、咬合能力および重心動揺について検討したものである。対象は保育園児及び小学生、事前に保護者より本研究の趣旨を理解し、同意と承諾が得られた園児 128 名（平均年齢 4 歳 6 ヶ月）、小学生 56 名（平均年齢 8 歳 1 ヶ月）とした。測定方法は、成長発達指標として身長、体重、足長と BMI 指数、咬合能力としてデンタルプレスケール<sup>®</sup>を用いて、咬合接触面積、平均咬合圧力、最大咬合圧力、咬合力を検討項目とした、重心動揺として姿勢解析システムポスタナ VTS-101<sup>®</sup>を使用し、開眼、閉眼状態時での動揺総距離、動揺総面積を検討項目とした。また、咬合力中心の位置より、正中群と偏位群 2 群に分類し、閉眼重心動揺面積測定値より、上位群と下位群 2 群に分類した、その後、各々の項目の関連性を比較検討した。

結果として、咬合発達に成長や性差が関係していることが示唆され、咬合バランス正中群は咬合機能と身体平衡機能が良く、重心動揺に咬合機能が関係していることが示唆され、咬合が身体平衡機能の一翼を担っていることが結論づけられた。

以上のように本研究は成長と咬合発達、重心動揺の関連性、口腔内歯列状態、咬合能力と重心動揺の関連性についてのスクリーニングにおいて、新知見を示した重要な研究と考えられる。よって本論文は博士（歯学）の学位論文に値するものと判断した。