資料４

Fluoride in the Central Nervous System and Its Potential Influence on the Development and Invasiveness of Brain Tumours—A Research Hypothesis

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13. Conclusions and Perspectives

①Fluorine is an environmental pollutant, which upon entering the human body disrupts many of its processes. Its impact on many organs, including bones, liver, pancreas, lungs, heart, skeletal muscles, and kidneys, can no longer be denied. Furthermore, the ability of fluoride to cross the BBB means that it may also interfere with metabolic processes in the central nervous system, which has been supported by the few studies investigating the role of fluoride in the brain. However, there are virtually no well-documented studies demonstrating a direct effect of fluoride on the development, invasiveness, or resistance of brain tumours, including gliomas. The scant reports from in vitro studies in neuronal cell lines and in vivo studies in rodents, as well as findings referring to other tissues and organs, including human models, allow for the formulation of some tentative questions and hypotheses on the adverse effects of fluoride in the context of brain tumours. What is more, these findings suggest that the role of fluoride in this process may be indirect rather than direct, including the effects exerted on normal cells and the tumour microenvironment. ②The negative impact of fluoride on the central nervous system in children and the growing incidence of pediatric brain tumours since the mid-1980s should serve as the most powerful motivations in our efforts to explain this phenomenon.

Fluorine is a trace element which has not received much attention in basic and clinical research. Nonetheless, with each passing year, there are more and more new papers shedding new light on its still unknown pleiotropic effects. The latest reports from studies on BBB permeation and the effects of fluoride on brain metabolism should inspire researchers to work toward a better understanding of its mechanisms of action. There have now been several studies on the role of micro- and macroelements in the development and treatment of gliomas and, surprisingly, in each one, fluoride has been completely overlooked in the analysis of minerals in brain tumours and whole brains.

① フッ素は環境汚染物質であり、人体に入るとそのプロセスの多くを混乱させます。骨、肝臓、膵臓、肺、心臓、骨格筋、腎臓など多くの臓器への影響はもはや否定できません。

② 小児の中枢神経系に対するフッ化物の悪影響と、1980 年代半ば以降の小児脳腫瘍の発生率の増加は、この現象を解明するための最も強力な動機となるはずです。

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