PYRIDOXINE STATUS IN CONVULSIVE EGYPTIAN INFANTS AND CHILDREN

Thesis

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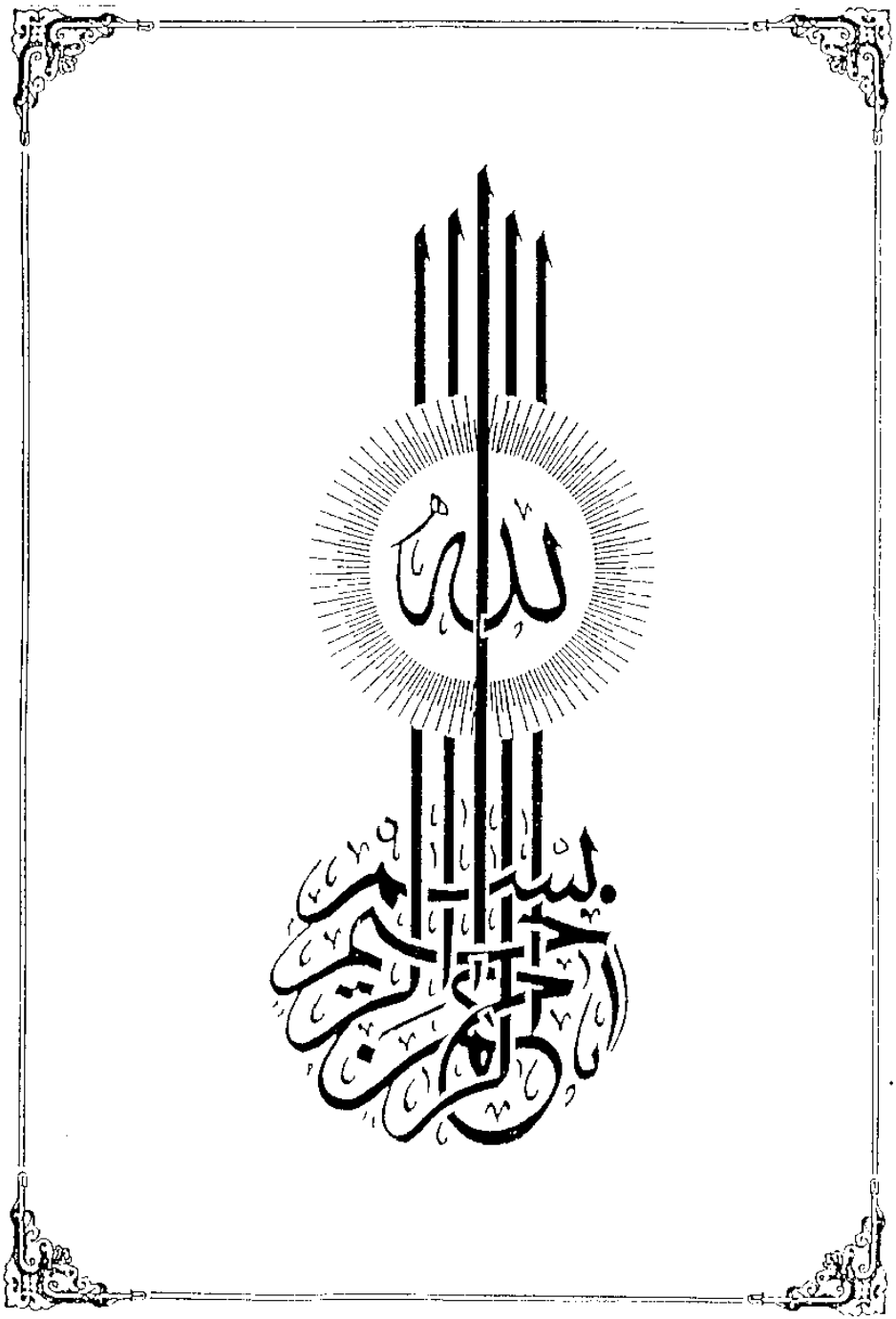

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LIST OF ABBRIVIATIONS

1. ACTH	adreno Cortico trophic hormone
2. AEDs	Antiepileptic drugs
3. ALA-D	5amino-levulinic acid dehydrogenase.
4. ALB	Albumin.
5. ALP	Alkaline phosphatase.
6. BF	Breast fed.
7. B6-HCL	Pyridoxine-hydrochloride.
8. CBMZP	Carbamazepine.
9. CBC	Complete blood cell count.
10. DNA	Deoxy ribo nucleic acid.
11. E.C	Enzyme activity coefficient.
12. EEG	Electroenchephalogram.
13. ECME	Early childhood myoclonic epilepsy.
14. EDTA	Ethylene-diamine-tetracetic acid.
15. EP	Erythrocyte protroporphyrine.
16. ETX	Ethuximide.
17. Fig.	Figure.
18. g/dl	Gram per diciliter.
19. GABA	γ-amino butyric acid.
20. GTCS	Generalized tonic-clonic seizures.
21. HC	Head circumference.
22. LEN	Length.
23. HLA	Histocompatibility.
24. Hb	Hemoglobin.
25. HKN	Hydroxykyneurenine.
26. ILAE	International league against epilepsy.
27. INA	Isonicotinyle hydrazide.

28. i.m.	intra msucular
29. i.v.	Intravenous.
30. JME	Jurenile myoclonic epilepsy.
31. KNS	Kyneurinines.
32. L	Liter.
33. MCv	Mean corpuscular volume.
34. mg	Milligram.
35. MPHH	Methyle phenyl hydantoin
36. MPB	Methyle phenobarbital.
37. NAD	Nicetineamid adenine dinucleotide.
38. OCA	Oral contraceptive agents.
39. P	Probability significance.
40. PL	Pyridoxal.
41. PLP	Pyridoxal-5'-phosphate.
42. PN	Pyridoxine.
43. PB	Phenobarbital.
44. PRM	Primidone.
45. Pmol/l	Picomole per liter.
46. n mol/l	Nano mol/liter.
47. 6-P	Short arm of chromosome 6.
48. 4-AA	4-pyridoxic acid.
49. RDA	Recommended daily allwance.
50. RNA	Ribonucleic acid.
51. T. ptn.	Total protein.
52. Uro-s	uroporphyrinogen I-synthetase.
53. VAP	Valproic acid.
54. Vs	Versus.
55. wk	Week.
56. wt	Weight

LIST OF CORRECTIONS

Page	Error	Correction
81	Ethuximide	Ethosuximide
136	n	in
140	dreaning	dreaming
143	Diphehydantoin	Diphenylhydantoin
	Five	Life
147	Peditric	pediatric
150	nutratine	nutrature
154	theoplylline	theophylline
156	anexiety	anxiety

INTRODUCTION AND AIM OF WORK

INTRODUCTION AND THE AIM OF THE WORK

1-*INTRODUCTION*

Pyridoxine has gained public acceptance as a component of body-building regimens and a remedy for a wide variety of brain functional disorders ***(Schamburg et al., 1983).***

The importance of this vitamin stems from its relationship to the developing brain and the broad implications of its effects on the molecular basis of intelligence, learning, memory and behavior ***(Coursin, 69)***. It is now well established that vitamin B6 deficiency can produce a variety of abnormalities of Central Nervous System, ranging from hyper irritability, hyperacusis, behavioral disorders to convulsive seizures and mental retardation ***(Reynolds and Leklem, 1986).***

2-AIM OF THE WORK.

This work aims to evaluate the B6 status among cases of idiopathic seizures in infants and children as an etiological cause among the Egyptian convulsive infants and children. As well as assessment of effect of antiepileptic drugs on the plasma level of B6 vitamers.

REVIEW OF LITERATURE

VITAMIN B6
(PYRIDOXINE)

(A) Chemistry

The term vitamin B6, or pyridoxine is used to refer to the three closely related compounds, pyridoxine, pyridoxamine and pyridoxal, together with their phosphate derivatives ***(Wyngaarden and Smith;1988).***

Structure and Sources:-

Vitamin B6 is a water soluble vitamin and is considered to be (as all water-soluble vitamins) among the safest substances known ***(Schumburg; 1983).***

Pyridoxine is the major dietary form found in plants (e.g.wheat, nuts, cereals, and vegetables), whereas pyridoxal and pyridoxamine constitute the major forms in foods from animal sources (liver, meat and milk) ***(Wilson & Davis; 1984).***

Pyridoxine is stable in acid solutions in absence of light, but it is highly sensitive in acid or neutral solutions in presence of light . Pyridoxal and pyridoxamine are destroyed at high temperatures, particularly autoclaving ***(Henderson; 1984).***

Considerable losses of vitamin B6 occur during prolonged heat processing particularly pressure cooking. Of the three forms, pyridoxine is the more resistant to food processing and storage ***(Hamaker; et al., 1990).***

Among all vitamin B6 compounds, pyridoxal 5'-phosphate (PLP) is the most important, because it constitutes the major coenzyme involved in the intermediary metabolism of amino acids and involved in heme and sphingosine bio-synthesis. All B6 compounds are inter-convertible and owe their enzymatic activity to conversion by tissues into PLP ***(McCormic; 1988).***

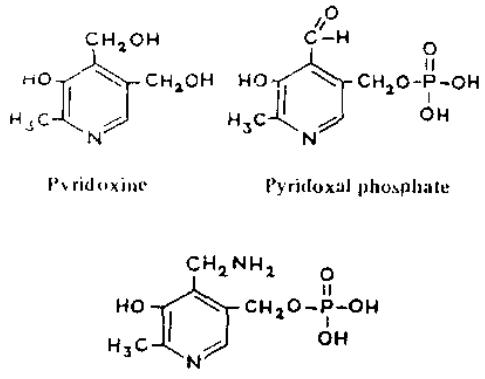

Fig. (1) Pyridoxine and its aldehyde vitamers.

Pyridoxine hydrochloride (PN.HCl) is the form of the vitamin used to fortify infants' milk formulas and in medications ***(Schuster; 1984).***

Bioavailability:-

The term bioavailability refers to the extent of intestinal absorption and metabolic utilization of the vitamin. It is expressed typically as a ratio of the concentration of the biologically available vitamin to the concentration of the total vitamin B6 in the diet ***(Gregory III & Ink 1987).***

The bioavailability of vitamin B6 is variable among its sources and depends on the over all components of the diet and food processing ***(Reynolds & Leklem,, 1988)***. There are major factors that affect the bioavailability of the vitamin.

Thermal processing was found to adversely affect the vitamin with loss of about 45% of its content in meat which is considered the major source of pyridoxal. It was also reported to destroy a considerable amount of milk-vitamin content especially through pasteurization and evaporation where pyridoxal and pyridoxamine are much more affected than pyridoxine ***(Reynolds; 1988).***

Dietary fibers were suggested to reduce the vitamin bioavailability from plant sources by 5 - 10% in plant foods, meanwhile about 85% of the vitamin is lost in refined flour (wheat flour). Dietary fibers may be claimed to increase intestinal excretion and decreased absorption of the vitamin ***(Leklem, & Miller, 1980)***.

On the other hand various types of dietary fibers have been shown to stimulate the intestinal flora (microorganisms) to synthesize vitamin B6; but human colon was found to have a little absorptive capacity for this synthesized vitamin ***(Nguyen & Gregory, 1981)***

Glycoside linkage: presence of glycosylated B6 (pyridoxine 5-glucoside), which is found in a variety of plant foods reduces the bioavailability of the vitamin by 75 - 80% lesser than that of the free formula riven from animal sources ***(Kabir, et al., 1983).*** **Fig. (2).**

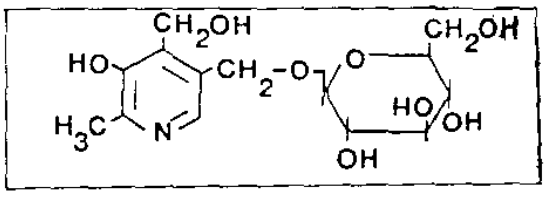

Fig.(2): Pyridoxine-B-D-glucoside