

# FREQUENCIES OF COMMON DEFICIENCY DISEASES AMONG JAPANESE

BY

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Among various kinds of malnutrition, most common vitamin deficiencies shall be reported here.

## (1) Vitamin B<sub>1</sub>.

Typical beriberi cases have been disappearing since the discovery of thiamine, but mild form of beriberi patients are not yet decreased so apparently, due to the still prevailing thiamine shortage of the daily diet for Japanese people.

The diagnosis of beriberi may be possible in recognizing such symptoms as loss of tendon reflex on knee and ankle joint, calf tenderness, hypesthesia on hand and leg, lowering of blood pressure and slight edema on lower leg. Besides these objective symptoms, several kinds of subjective complaints, such as loss of appetite, full and heavy sensation of stomach, constipation, palpitation, short breath, easy fatigability, disturbed sleep, dizziness and nervousness etc. may be considered as coincident symptoms.

Through such diagnostic procedure, we can detect the mild form of beriberi still about 20 per cent of entire nation, and the result of national nutrition survey by Welfare Ministry give about 8 per cent of population as beriberi cases examined only through the loss of tendon reflex on knee joint. Dr. T. Sawada in Kyushu University found also about 20 per cent of population as mild form of B<sub>1</sub>-deficiency through his urine test for pyruvic acid (Tables I and II).

Regarding the prevention of thiamine shortage, B<sub>1</sub>-enrichment of white rice will be explained briefly in this presentation.

## (2) Vitamin B<sub>2</sub>.

Among various symptoms due to B<sub>2</sub>-deficiency, angular stomatitis (so-called *perlèche*) is most common among Japanese people, which amount about 6 per cent in its frequency according to the national nutrition survey (Table III). By further detailed survey by the author in several different groups during several years, it was discovered far higher in its frequency, namely 20 to 30 per cent of population in both sexes.

Table I. Frequency of Beri-beri cases in different districts.

Name of districts	Time of examinatin	Number of Subjects	Beri-beri cases (%)		Remarks
			male	female	
S. village in Chiba prefecture	August, 1949	138	18.4	22.8	farming
I. village in Chiba prefecture	//	157	23.5	15.5	farm & fishing
N. village in Chiba prefecture	October, 1950	189	16.7	20.0	//
Out patients in Our clinic, Tokyo	August, 1951	375	21.5	36.5	all new pats
O. village in Tochigi prefecture	February, 1953	289	15.4	17.8	farming
A & B villages Nagano prefecture	August, 1953	185	26.3	24.8	//
O. village in Ibaraki prefecture	//	95	25.8	30.1	//
Average	for 7 years	1428	20.4	24.8	—

Table II. Frequency of Beri-beri cases among Japanese.  
The national nutrition Survey.

(expressed in %)

Subjects	Years										
	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	
Whole Population	7.6	8.0	7.0	7.3	7.4	7.5	6.8	9.1	10.5	9.5	
Urban Population	—	6.5	7.4	6.7	7.1	6.6	5.9	8.7	—	—	
Rural Population	7.2	7.8	6.8	7.6	7.7	8.3	7.6	9.5	—	—	

Table III. Frequency of angular stomatitis.  
The national nutrition Survey.

(expressed in %)

Subjects	Years										
	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	
Whole Population	5.9	7.4	7.1	4.5	4.7	5.4	5.4	5.4	6.3	6.3	
Urban Population	—	4.9	3.3	2.1	2.4	2.2	2.9	2.7	—	—	
Rural Population	8.3	8.7	9.4	6.1	6.7	7.7	7.6	8.1	—	—	

It was more frequent in younger generation and in rural inhabitants than in older and urban inhabitants (Table IV).

Table IV. Frequency of perlèche in rural groups in Japan.  
(Case expressed in %)

Name of Districts	Time of Survey	Male		Female	
		Subjects	Case	Subjects	Case
S. village, Chiba.	August, 1949	69	25.0	90	25.2
I. village, Chiba.	"	76	5.9	96	4.5
N. village, Chiba.	October, 1950	85	23.6	104	19.0
N. village, Chiba. School Children	"	186	25.5	159	17.3
Chiba prison	December, 1950	118	8.3	—	—
"	March, 1951	119	34.4	—	—
O. village, Tochigi	February, 1953	140	39.5	149	36.5
O. village, Tochigi School Children	"	245	29.6	268	18.7
S. village, Ibaraki.	February, 1956	133	32.3	117	28.2
Average	for 7 years	1072	24.9	983	21.5

In such cases the B<sub>2</sub> content of blood serum was lowered in general and has recovered to normal level after treatment.

### (3) Vitamin A.

Average daily allowance of vitamin A for Japanese nation is set up 4000 I.U. for adults, while their actual intake of this vitamin amounts only to about 2500 I.U., according to the national nutrition survey (Table V). Corresponding to this shortage of vitamin A in their diet, sign of A-deficiency represented by follicular hyperkeratosis is found about 3 per cent of population almost every year (Table VI). By the author himself a little higher percentage of morbidity was realized in several districts during these years (Table VII). And in cold season the figure was higher than in warmer season (Table VIII).

Table V. Yearly average intake of vitamin A of Japanese.  
The national nutrition survey.  
(A expressed in I. U.)

Years	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Groups										
Whole Population	2,416	2,459	2,262	2,700	2,721	2,814	2,904	3,189	3,386	3,281
Urban Population	3,055	3,251	2,292	3,014	2,902	3,047	3,075	3,348	—	—
Rural Population	2,335	2,417	2,245	2,496	2,601	2,640	2,754	3,027	—	—

Table VI. Frequency of follicular hyperkeratosis among Japanese. (%)  
The national nutrition Survey.

Years	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Groups										
Whole Population	1.1	1.7	1.8	2.2	2.4	2.6	2.7	3.1	3.5	3.5
Urban Population	1.8	2.1	1.4	1.2	1.6	2.0	1.9	3.0	—	—
Rural Population	1.0	1.5	1.7	2.7	3.0	3.1	3.3	3.2	—	—

Table VII. Frequency of follicular hyperkeratosis in different districts. (%)  
The results by the author himself.

Items	Time of Survey	Male		Female		Remarks
		Subjects	Case	Subjects	Case	
N. village, Chiba.	October 1950	85	1.4	104	2.2	farming & fishing
Chiba prison.	December 1950	208	23.0	—	—	hand working
O. village, Tochigi.	February 1953	154	6.7	135	7.1	farming
O. village, Ibaraki.	August 1953	133	10.5	117	5.1	//
Average	—	580	18.5	356	5.1	—

#### (4) Vitamin D.

Clinical incidence of typical rickets is rather rare in Japan. However, roentgenologic examination of infants and young children will reveal a pretty high incidence of ricketial lesion of bone system, amounting from 10 to 30 per cent of examined subjects in general.

Table VIII. Seasonal variation of frequency of follicular hyperkeratosis.

The results of nutritional survey in one kinder garden.

Survey in 1958~1959	Number of Children	Case incidence	
		Number	%
November	144	17	11.8
December	131	26	19.9
Feburuary	127	31	24.4
March	138	15	10.9

## (5) Vitamin C.

Vitamin C content of Japanese diet amount in average around 100 mg. per day, but due to the cooking procedure the real intake of it may fall to 50 mg. or less, while the normal allowance of vitamin C for adults is set up to 60 mg. per day. Namely the vitamin C is also lacking in Japanese diet in general, so that there must be some injurious effect on the entire body, especially on the mesodermal system, such as bone, muscle, blood etc. However, a typical survey case is quite rare in Japan and we can only suspect such vitamin C deficiency in gingival bleeding or other teeth lesion.

The only way to estimate the shortage of vitamin C intake might be the determination of C level in blood plasma, which is fixed about over 1.0 mg. per dl. for healthy adults in Japan, while we found it as the average of 90 normal person 0.81 mg. per dl. (0.85~1.03 mg. per dl.).

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