Balance Disorders in the Elderly and the Benefit of Balance Exercise

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Symptoms of balance disorders including 'unsteadiness', 'dizziness and vertigo' are common in the elderly and commonly found in general practice in medicine. There are many causes of balance disorders and vary from one person to another. Disorder of the internal ear or vestibular end-organ type is one cause. Unsteadiness of somato-sensory or proprioception is common in the elderly so is degenerative disorder of central control in brain. The elderly are prone to many chronic illnesses or disorders which are causes of balance disorder or give rise to more rapid degeneration of the central nervous system i.e. high blood pressure, diabetes mellitus, heart disease, proprioception and joint problems, arthritis and muscular weakness due to lack of good health and exercise. The objectives of this research study were to find the etiologies of balance disorders and how Balance Exercises and the 'National Health Service' can be of benefit in helping to prevent them.

1565 elderly inhabitants (age $\geq$ 60 years) of 20 communities adjacent to Siriraj Hospital were selected for study. Among these, 625 persons had a history of balance disorders. Among those, 256 had symptoms during the week selected for examination. The average age was 66 years old, women outnumbered men with a ratio of 2.4:1. The common underlying causes were hypertension in 32.4%, diabetes mellitus 13.8%, arthritis 8.1%, and heart disease 4.4% respectively. All are still taking one or more types of drug. The subjects were randomly divided into two groups for the study purpose of effectiveness of balance exercise. Group 1 did not perform the head balance exercise and Group 2 performed the head balance exercise. Audiometric testing showed impaired hearing in 90% of the subjects. The majority slowed hearing loss in high frequencies. Testing of middle ear function found 75% of Group 1 to have normal middle ear function 77% of Group 2. Brainstem Electrical Response Audiometry (BERA) showed normal response latencies of in 96% of group 1 and 94% of Group 2. Poor morphology of waveform was found in 12% of Group 1 and 16% of Group 2. Doppler sonography for intra-cranial blood flow measurement showed abnormal flow of the ICA in 17.6% of group 1 and 20.16% of group 2. Basilar arterial abnormal flow was found in 77.6% of Group1 and 80.6% of Group 2 respectively. The flow of ICA was improved after 8 weeks in both groups. The measurement of balance by Posturography showed 86.7% abnormality in Group 1 and 83.5% abnormality in Group 2 (and the majority due to inner ear problems but many cases had a mixture of joints and CNS problems too). Results of the self-evaluation (by questionaires) showed the elderly to have symptoms of light headedness in 51% and loss of balance in 29%, Vertigo with rotation occurred in 23.6%. 49% of the symptoms were intermittent, 56.4% experienced a "fall". On questioning about the benefit and performance of Head and Neck Exercises, 82.8% found the exercises were easy to perform, 56.4% said the results were very beneficial.

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It is well known that symptoms of balance disorders i.e. unsteadiness, dizziness, vertigo are common in the elderly and commonly found in general medical practice. Vestibular sedation is widely used to suppress these symptoms. This may interfere with habituation and produce drowsiness. It may also suppress brain function and lead to a "fall". The causes of unsteadiness, dizziness and vertigo are many, and vary from one person to another. Vestibular malfunctions range from mild disorders of the inner ear peripheral vestibular organs, to malfunction of proprioceptive and joints senses, to severe disorders of central control in the brain.

The elderly are prone to many chronic diseases or disorders e.g. high blood pressure, diabetes mellitus, heart disease, proprioceptive and joint problem, arthritis and muscular weakness and lack of daily activity and exercise.

Habituation can be promoted by vestibular exercises such as the Cawthorne and Cooksey "Head-Neck-Balance Exercise". These exercises are based on directing the balance system back to normal everyday movement of head working with the inner ear balance system, the neck, the body and the joints in connection with vision. The elderly can then become confident in everyday movements.

Objective

i) To identify the factors involved in balance disorders in the elderly.

ii) To study the effect of "Head-Neck Balance Exercise" as a method for rehabilitating patients with balance disorder.

Material and Method
Personnel

The research team consisted of ENT specialists, neuro-otologists and neuro-otological technicians of the Neuro-Otology Unit of ENT Dept. of Siriraj Hospital.

Population

The 1565 elderly inhabitants (age ≥ 60 years) of 20 communities adjacent to Siriraj Hospital were selected for study. Each person was interviewed by nurses in the team regarding symptoms of vestibular or spatial disorientation. 625 had experienced symptoms of dizziness or imbalance over the past six months. Those with current symptoms were invited to participate in the study and to assess method of balance. There were 256-elderly who were still suffering from

balance disorders at the time they were called- in were then being included in the study.

General history of illness and demographic records were made. The elderly were then proceeded to the following examinations:
1. Otoscopic Study
2. Audiometric test for hearing acuity.
3. Acoustic Impedance and Stapedial reflex test of eardrum and middle ear function
4. Brainstem Electrical Response Audiometric test for evaluation of brainstem function.
5. Doppler Intracranial Ultrasonography test for intracranial blood circulation performance evaluation.
6. Posturography by Tetrax Inter-Balance System - to study how good the balance system was and where the disorders were i.e. in the vision, peripheral inner ear vestibular system, or proprioceptive systems of joints and muscle or CNS, or combined.

After testing, the subjects were divided into two groups for the purpose of evaluating the "Head-Neck Balance Exercise". Each subject was given a serial number. All were given multi-vitamin preparation daily for 20 weeks.

Those with an even number were also given at the start of the study a leaflet which provided instructions on how to perform the "Cawthorne - Cooksey - Head-Neck-Balance Exercise". These they continued for a period of 20 weeks. The odd number subjects were not offered the Head Balance Exercise leaflet until the 9th week.

Each subject recorded the subjective magnitude of severity of his or her imbalance or other vestibular symptoms on a numerical scale from 0 to 10. This was done weekly for a period of 8 weeks to give a global value of the symptomatology over the proceeding week. The first subjective measurement was obtained at the start of the examination conducted in the Neuro-otology Clinic. The second subjective assessment was one week later and at the end of each week for 8 weeks. A final subjective assessment was made in each subject at the 20th week.

Posturography and Ultra-sonography studies were repeated at the end of the 8 week period.

After 8 weeks, all subjects were asked to perform the Head and Neck Balance Exercise until week 20th.

At the end of the 20 week of study period all subjects were asked to answer the questionnaires as to the simplicity of the Head Balance Exercise, it's

benefit and severity of symptoms over all. The accompanying symptoms were also asked and were analyzed. Statistical analysis: Descriptive statistics and unpaired t-test, Chi-square test and Fisher exact test were applied to describe population characteristics and comparing the difference results between two groups p-value of 0.05 was considered to be statistically significant

Time schedule

The two years period March 1998-March 2000.

Results

The results of the study are shown as follows:

1. Aging population under study

There were 1565 elderly people from 20 communities in the study. 625 of these had experienced symptoms of dysequilibrium, unsteadiness or vertigo in the past 6 months and were called-in for interview. After interviewing 265 cases were still suffering from these symptoms and were included in the study. Out of 265 cases, only 215 cases completed the whole study, the remainder were lost to follow up over the course of the study.

A Student t-test and chi-square test gave a p-value for differences in age between the 2 groups of 0.48 (i.e. not significant) p-value for male:female ratio = 0.16. There were no significant differences in age and the male:female ratio between the two groups (p > 0.05).

2. Common illness

The chronic illnesses found in the elderly were hypertension, diabetes mellitus, arthritis and heart disease. Almost all patients were on drugs for the treatment of those disorders.

On chi-square test or Fisher exact test it was found that only heart disease was significantly different between the two groups. The most common condition was hypertension, followed by diabetes mellitus and joint problems respectively.

3. Severity of symptoms using the 'Subjective Magnitude Numerical Scale'

The Subjective Magnitude Numerical Scale is from 0 (without symptoms) to 10 (maximum severity of symptoms.) The SMNS in Group 1 was 4.27 and Group 2 was 4.20 at the start of the study (week 0) but gradually became less severe during the course of the study to become 1.52 in Group 1 and 0.99 in Group 2 at the end of week 8 as shown in Table 3. There was no

significant difference in remission of symptoms between the groups (p > 0.05) (chi-square test).

4. Audiometry results

Pure Tone AC and BC: results in both groups are averaged as the two groups showed no difference in their hearing loss throughout all frequencies tested.

5. Acoustic Impedance Test for middle ear function

From Table 4 using chi-square test there was no significant difference in the type of tympanogram,

Table 1. Comparing Male:Female ratio and age in the 2 groups

	Control Group 1 n = 105	Study Group 2 n = 110	Total n = 215
Male	23	31	54
Female	82	79	161
M: F	1:4	1:2.4	1:3
Age (yrs)	60-85	67-87	60-87
Av. Age	67.6±5.52	67.26±6.45	67.43±6.00

Table 2. Prevalence of chronic illness in the study population

Diseases	Group 1 n = 105 (%)	Group 2 n = 110 (%)	p-value	Total 2 group (%)
Hypertension	29 (27.6)	37 (33.6)	0.42	66 (32.4)
Heart Diseases	7 (6.7)	1 (0.9)	0.03*	8 (4.4)
Arthritis	13 (12.4)	7 (6.4)	0.20	20 (8.1)
Diabetes Mellitus	14 (13.3)	14 (12.7)	0.94	28 (13.8)
Allergy & Asthma	13 (12.4)	4 (3.6)	0.34	17 (7.8)
Ear Diseases	6 (5.7)	2 (1.8)	0.16	8 (4.4)
Others	29 (27.6)	23 (20.9)	0.32	52 (27.5)
Number	n = 105	n = 110		(215)

* Statistically significant (p < 0.05)

Table 3. Cumulative count of remission of symptoms from week 1 to week 8 in both groups

Week	Group 1 105 cases	Group 2 110 cases	p-value
1	21	12	0.09
2	28	19	0.13
3	35	25	0.11
4	35	28	0.26
5	36	39	0.97
6	37	35	0.70
7	39	38	0.80
8	45	49	0.91

Table 4. Shows the comparison of eardrum function and the middle ear and the stapedial reflex in the right and left ears between the 2 groups (Tympanometric and stapedial reflex tests)

	Rt. ear			Lt. ear		
	Group I 125	Group 2 126	p-value	Group 1 125	Group 2 126	p-value
Tympanogram						
• Type A	93 (74.4)	95 (75.4)	0.78	93 (75.5)	99 (78.6)	0.91
• Type B	30 (24.0)	26 (20.6)	0.50	30 (24.0)	24 (19.0)	0.33
• Type C	2 (1.6)	3 (2.4)	1.0	1 (0.8)	3 (2.4)	0.62
• No seal	1 (0.8)	2 (1.6)	1.0	1 (0.8)	2 (1.6)	1.0
Stapedial reflex						
• Positive	102 (82.9)	76 (61.3)		113 (79.7)	84 (66.7)	
• Negative	23 (17.1)	48 (38.7)	0.006	11 (20.3)	42 (33.3)	0.000004
Mean Middle earCompliance (cc)	(0.36)	(0.41)		(0.37)	(0.41)	
Mean Middle earPressure (daPa)	(-32)	(-23)		(-25)	(-29)	

Notes: Type A = normal, Type B = Otitis media with effusion, Type C = negative middle ear pressure > -100 daPa

mean middle ear compliance, middle ear pressure or Stapedial reflex between the two groups (p < 0.05).

6. Result of Doppler Intra-cranial Sonography

Criteria for Interpretation of result

Abnormal Flow:

1. Reduced flow > 50% less than expected
2. Lateralization > 50% difference between the two sides

I C A Mean = 30 + 9 cm/sec (21-39)
B A Mean = 35 + 7 cm/sec (28-42)
O A. Mean = 21 + 5 cm/sec (16-26)

(Using the average of result age 40-60 since there has never been any study for the age group > 60 yrs was taken from a recommendation in the Manual of Intra-cranial Doppler Sonography)
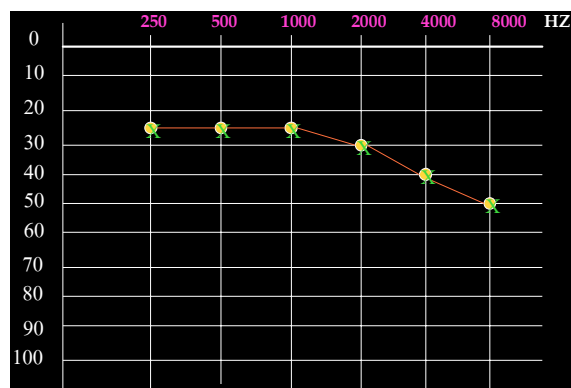
X threshold of hearing left ear
threshold of hearing right ear

Fig. 1

I C A = Internal Carotid Artery
B A = Basilar Artery
O A = Ophthalmic Artery

From Table 5 using chi-square test the most abnormal flow of blood to the brain was in the Ophthalmic artery followed by the basilar artery. There was no significant difference between the 2 groups (p > 0.05).

From Table 6 using chi-square test it was found that at week 8 there was no difference in cerebral blood flew between the 2 groups (p > 0.05).

Table 5. Percentage of abnormalities in cerebral blood flow found in the two groups at week 0

Week 0	Group 1 Cases (%)	Group 2 Cases (%)	p-value	Total %
ICA	21 (17.6)	25 (20.2)	0.74	46 (18.9)
BA	92 (77.3)	100 (80.6)	0.63	192 (79.0)
OA	116 (97.5)	111 (89.5)	0.25	227 (93.4)
Total	119	124		243

Table 6. Comparing cerebral blood flow in Group 1 and Group 2 in week 8

	Abnormal Doppler at Wk 8			
W 8	Group 1 N (%)	Group 2 N (%)	p-value	Total N (%)
ICA	10 (10.2)	9 (10.3)	0.83	19 (10.3)
BA	78 (79.6)	74 (85.5)	0.44	152 (82.2)
OA	95 (96.9)	87 (100)	0.25	182 (98.4)
Total	98	87		185

Table 7. Comparing the results of cerebral blood flow between the two groups at week 0 and week 8

	Abnormal Doppler at Week 0 and Week 8					
	Group 1			Group 2		
	Week 0 n = 119 (%)	Week 8 n = 98 (%)	p-value	Week 0 n = 124 (%)	Week 8 n = 87 (%)	p-value
ICA	21 (17.6)	10 (10.2)	0.17	25 (28.7)	9 (7.3)	0.03*
BA	92 (77.3)	78 (79.6)	0.81	100 (114.9)	74 (59.7)	0.16
OA	116 (97.5)	95 (96.9)	1.00	111 (127.6)	87 (70.2)	0.35
Total	119	98		124	87	

* significant difference p-value < 0.05

From Table 7 using the chi-square test it was found that in Group 1 after 8 weeks there was no difference in flow in the ICA (p > 0.05) whereas in Group 2 there was a significant change (an increase in flow of the ICA) (p = 0.03).

7. Results of Tetrax Inter Balance Posturography
Criteria for Interpretation

□ = 1 = Normal, no sway
■ = 2 = Slight sway
■ = 3 = Moderate sway ⎫
■ = 4 = Severe sway ⎬ = Abnormal

8 positions tested
N O = Normal eyes open
N C = Normal eyes closed
P O = Standing on Pad, eyes open
P C = Standing on Pad, eyes closed
H R = Head turned to Right
H L = Head turned to Left
H B = Head extended backward
H F = Head Flexed

Test Frequencies
F1 = Vision
F2-F4 = Inner Ear
F5-F6 = Proprioceptive and joints sense
F7-F8 = CNS

The study of overall Stability (ST), Weight Distribution Index (WDI), Synchronization of the Body (SYN) and the Toe-Heel weighting were also studied.

From Table 8 using chi-square test it was found that most patients had abnormal Posturography and the majority of these had an inner ear problem followed by the proprioceptive or joint problems and CNS problems respectively.

From Table 9 using the chi-square test it was found that there was a significant difference in the number of subjects showing abnormality on posturography at week 8 between the two groups (p = 0.03) but there was no difference in the location of the abnormality between the two groups at week 8 (p > 0.05).

Table 8. Results of abnormal Posturography (see criteria for interpretation) in Group 1 and Group 2 at different frequencies

	Week 0			
Location of Abnormality	Total n = 225 (%)	Group 1 n = 105 (%)	Group 2 n = 110 (%)	p-value
Posturography	183 (81.3)	91 (86.7)	92 (83.6)	0.66
Vision F1	18 (8.0)	8 (7.6)	10 (9.1)	0.89
Inner Ear F2-4	175 (77.8)	93 (69.5)	82 (74.5)	0.14
Proprioceptive & Joints F5-6	110 (48.9)	60 (57.1)	50 (45.5)	0.12
CNS F7-8	97 (43.1)	49 (46.7)	48 (43.6)	0.76

Table 9. Comparing abnormal Posturography results in the two groups at Week 8

	Week 8			
Location of Abnormality	Total n = 225 (%)	Group 1 n = 105 (%)	Group 2 n = 110 (%)	p-value
Posturography	183 (81.5)	95 (90.5)	88 (81.5)	0.03*
Vision F1	15 (6.6)	9 (8.6)	6 (5.5)	0.53
Inner EarF2-4	163 (72.4)	81 (77.1)	82 (74.5)	0.78
Proprioceptive & Joints F5-6	127 (56.4)	60 (57.1)	67 (60.9)	0.67
CNS F7-8	97 (43.1)	47 (44.8)	50 (45.4)	0.97

* p-value < 0.05

Table 10. Comparing the results of stability (ST), weight distribution index (WDI), synchronization of body (SYN) and weight on Toe/Heel. Percentage of the difference in abnormality of balance in the two groups in week 0 and week 8 are shown

	Group 1 n = 105 (%)	Group 2 n = 110 (%)	p-value
ST			
Week 0	33 (31.4)	34 (30.9)	0.95
Week 8	41 (39.4)	31 (28.2)	0.12
p-value	0.45	0.60	
WDI			
week 0	10 (9.5)	9 (8.2)	0.92
week 8	8 (7.6)	7 (6.4)	0.93
p-value	0.73	0.72	
SYN			
week 0	63 (60.0)	66 (60.0)	0.89
week 8	57 (54.3)	62 (56.4)	0.86
p-value	0.28	0.41	
Toe/Heel			
Week 0	43 (41.0)	42 (38.2)	0.78
week 8	40 (38.1)	38 (34.5)	0.69
p-value	0.58	0.49	

From Table 10 using the chi-square test it was found that there was no significant difference between the two groups either in stability, weight distribution index, synchronization or toe/heel weight at both week 0 and week 8 (p > 0.05) and there was no significant difference when comparing week 0 and week 8 between the two groups (p > 0.05).

From Fig. 2 and 3 there was no significant difference in postural stability in either groups at week 0 and week 8.

8. Results of Brainstem Electrical Response Audiometric Test (shown in Table 11)

From Table 12 using the chi-square test it was found that there was as difference between the 2 groups either between ears or for both ears (p > 0.05) in any of the abnormal parameters studied.
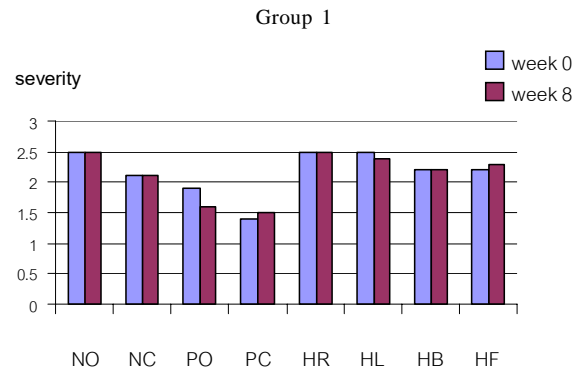

Fig. 2 Shows the average value of posture control obtained by posturography in Group 1 comparing week 0 and week 8
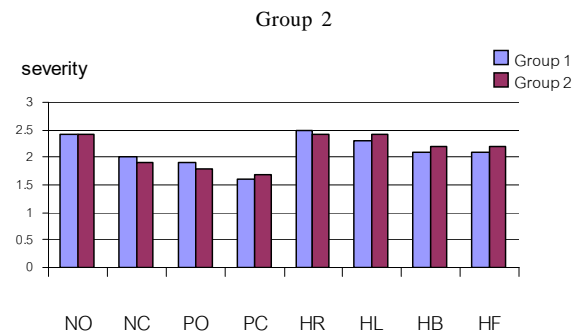

Fig. 3 Shows the average value of posture control obtained by posturography in Group 2 comparing week 0 and week 8

Table 11. Results of Brainstem Electrical Response Audiometry in the 210 cases studied when comparing Rt. and Lt. ear

Abnormal Result	Rt. Case	(%)	Lt. Case	(%)	Both ears Case	(%)
1. Delayed Wave V	7	(3.3)	6	(2.9)	2	(1.0)
2. Abnormal Morphology	37	(17.6)	47	(22.4)	30	(6.8)
3. Threshold of response > 30 dB	63	(30.0)	66	(31.4)	52	(24.8)

Table 12. Comparing Brainstem Electrical Response Audiometry between the two groups

	Rt		p-value	Lt		p-value	Both ears		p-value
	Group 1 100 (%)	Group 2 110 (%)		Group 1 100 (%)	Group 2 110 (%)		Group 1 100 (%)	Group 2 110 (%)	
1. Delayed Wave V	3 (3)	4 (3.6)	1.0	4 (4)	2 (1.8)	0.43	2 (2)	0 (0)	0.22
2. Abnormal Morphology	15 (15)	22 (20)	0.44	20 (20)	27 (24.5)	0.57	12 (12)	18 (16.4)	0.09
3. Threshold of response> 30 dB	33 (33)	32 (29.1)	0.45	35 (35)	31 (28.2)	0.36	30 (30)	22 (20)	0.09

9. The Subjective Severity of Symptoms at week 0, week 8 and week 20 (shown in Table 13)

There was no significant different of subjective magnitude numerical scale between the two groups from week 0 to week 20 (p > 0.05)

10. Study of varieties of symptoms

At completion of the study the elderly were asked to fill-in the questionnaires for the variety of symptoms that had occurred subjectively. It was found that 51 percent had symptoms of dull-headedness, 29 percent had symptoms of dysequilibrium and 23.6 percent had real vertigo. For dull-headedness 51 percent suffered most of the time, 23.6 percent of the symptoms happened once in a while, 19.3 percent stated they often happened and 13.6 percent stated once in a while.

11. Study of accompanying Symptoms

Ataxia was most the common complaint in 41.4 percent, while ringing in the ears (tinnitus) came as the second most common of 22.8 percent, fall as well as weakness were equally experienced in 20 percent and fainting 19.3 percent.

12. Study of the simplicity and benefit in performing the 'Head-neck Balance Exercise'

Most elderly people (82.8%) said that the Head Balance Exercise can be performed easily and that it produced great benefit (56.4%) and gave rise to fewer symptoms by week 20 in 61.4% while 19.3% said their symptoms were completely cured, 5.7% said symptoms persisted still.

Table 13. Shows the average severity of symptoms using the Subjective Magnitude Numerical Scale for each week in the two groups (p-value can not be calculated since there is no SD)

week	Group 1	Group 2
0	4.27	4.2
1	2.88	2.23
2	2.56	2.06
3	1.97	1.82
4	1.93	1.75
5	1.79	1.31
6	1.73	1.4
7	1.98	1.46
8	1.52	0.99
20	1.11	0.72

Discussion

Balance disorders with symptoms of unsteadiness, dizziness or vertigo were found to be common complaints in the patients of all age groups, but more in the elderly group. The etiologies of these disorders in the elderly were not as specific as in the younger age group. Since the symptoms can be caused by many chronic illnesses i.e. systemic diseases like high blood pressure, metabolic disorders like diabetes mellitus, degenerative diseases like arthritis or proprioceptive and joint problems as well as insufficient flow of blood supply to the brain and degenerative change of brain and the CNS.

The disorders can lead to serious health problems, inability to move around and lead to falls. Understanding of the underlying problems and trying to solve them seemed to be helpful in almost all cases. Rehabilitation to maintain normal balance and help restoring balance were proved to be most helpful with small effort and expense. The Cawthorne - Cooksey "Head and Neck Balance Exercise" was helpful and acceptable by almost all elderly with 90% satisfaction.

Recommendation

1. Health Information Package and Awareness of Balance Disorders and Its Sequalae

As there is rapid growth of the elderly population in Thailand which was estimated to be 11.3 million in the year 2563. Therefore, the well-being of the elderly should be confronted to lessen the burden of health care in the country. The elderly population should have a good health status to ensure the quality of life as well as to lessen the burden on medical care of the country and to the benefit of the socio-economic conditions of the country. A General Health Advice Package should include awareness of the diseases or disorders that cause Balance System Disorders and how to prevent them at the level of Community Health Care.

2. Information to Primary Health Personnel at Community Level

As 'Balance Mechanism' involved many organs of the body i.e. vision, balance system of the internal ear, joints, CNS and brain and almost of these organs have special sense deterioration in the elderly with aging but if superimposed with ill health, degeneration is more rapid. As most elderly are suffering with symptoms of imbalance, dizziness or vertigo which are partly due to degenerative change in aging but superimposed with chronic illness. Medication to control symptoms can be helpful in the short term

but will never cure them since many disorders may be left with sequaelae. Therefore, restoring balance by rehabilitation is helpful and cost effective, The symptoms of balance disorders should be looked at as the symptoms created by disorders of the whole body.

3. Encourage Vestibular Exercise/Rehabilitation in all the elderly

All exercise if done correctly and not too excessively will be good for health. The Head Neck Balance Exercise is not harmful but will help all people and all ages has proved important in restoring vestibular habituation in patients with vestibular disorders particularly in the elderly group to help maintain normal everyday function for every movement of everyday life and to ensure confidence when moving around.

4. Community Primary Care and Prevention should be considered for the Health System

Medical Care has proved to be expensive and will not solve the problem in the long term.

Community-based Rehabilitation and the primary care concept should be considered. Therefore, training of health personnel at the primary level is recommended together with a good referral system. Specialists are for special or problem cases only, which should be less than 10%.

5. Encourage the Family Doctor System

All people should register with a family doctor as the first contact for any health problem.

Good cooperation among family doctors, patients, and their families should be encouraged in the delivery of medical care for understanding of the situation and for 'together responsibility' in managing the patient's illness.

6. Specialists should be involved in the primary health care system

Specialists should understand the real situation of health problems of patients and not to work with narrow vision by only looking at one disease and only treating the disease and not the patient as a person.

Application

1. Ministry of Public Health
2. Bangkok Metropolitan Health Department
3. Medical Institutions and Training Centers
4. Community Based Rehabilitation Sections
5. Health Workers Training centers

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โรคเวียนศีรษะในผู้สูงอายุ และการบำบัดฟื้นฟู

สุจิตรา ประสานสุข, ชนะ สิริยานนท์, อภินันท์ ณ นคร, สุวัจนา อธิภาส, สมุทร จงวิศาล

อาการเสียการทรงตัวในผู้สูงอายุ เช่น เดินเซ เวียนหัว บ้านหมุน เป็นอาการที่พบบ่อยในผู้สูงอายุที่มาพบแพทย์ทั่วไป มีสาเหตุ ตั้งแต่ จากการเสื่อมของอวัยวะทรงตัวในหูชั้นใน ร่วมกับการเสื่อมของประสาทสัมผัสต่าง ๆ และสมอง ตามัว เห็นอะไรไม่ชัด การอ่อนล้าของกล้ามเนื้อแขน ขา และการเสื่อมของข้อต่อของร่างกาย ยิ่งกว่านั้นผู้สูงอายุยังมีโรคเรื้อรังทางกายได้หลายอย่าง เช่นความดันโลหิตสูง เบาหวาน โรคหัวใจ โรคข้อ และ กล้ามเนื้ออ่อนแรง เนื่องจากสุขภาพไม่ดีและขาดการออกกำลัง อาการเสียการทรงตัวอาจนำไปสู่การล้ม ซึ่งจะมีอันตรายอื่น ๆ ตามมา เหล่านี้เป็นปัญหาทางสาธารณสุขของประเทศ และสมควรให้ความสนใจในการดูแลผู้สูงอายุในเชิงป้องกัน และสร้างเสริมสุขภาพโดยรวม เพื่อให้ผู้สูงอายุมีคุณภาพชีวิตที่ดีในวัยชรา คณะผู้วิจัยจึงมีเป้าหมาย ศึกษาหาสาเหตุ โรคที่พบร่วม และผลการบริหารศีรษะ ในผู้สูงอายุ

ได้สำรวจผู้สูงอายุใน 20 ชุมชน ที่มีอายุตั้งแต่ 60 ปีขึ้นไป จำนวน 1565 ราย พบว่า ว่า 625 ราย เคยมีอาการเวียนศีรษะเสียการทรงตัว และ 256 ราย ยังมีอาการอยู่ จึงได้นำทั้ง 256 รายมาศึกษา พบว่าอายุเฉลี่ย 66 ปี เป็นหญิงมากกว่า ชาย โรคที่พบร่วมและน่าจะเป็นปัจจัย ได้แก่ ความดันโลหิตสูง เบาหวาน โรคข้อ และโรคหัวใจ ร้อยละ 32.4, 13.8, 8.1 และ 4.4 ตามลำดับ ตรวจความสามารถทางการได้ยิน หูชั้นกลาง การทรงตัว การทำงานระดับก้านสมอง การไหลเวียนกระแสโลหิตไปสมอง และ แบ่งผู้สูงอายุเป็น 2 กลุ่ม โดยกลุ่ม 1 ไม่บริหารศีรษะ และ กลุ่ม 2 ให้บริหารศีรษะ เพื่อการทรงตัวที่ดี หลัง 8 สัปดาห์ ติดตามประเมิน การหายหรือทุเลาของอาการ

ผลการศึกษาพบว่าผู้สูงอายุมีการเสียการได้ยินร้อยละ 90 เป็นประสาทรับเสียงสูงเสื่อม โดย ร้อยละ 76 มีหูชั้นกลางปกติ การศึกษาการได้ยินระดับก้านสมองพบว่า ร้อยละ 14 มี ลักษณะคลื่นสมองบกพร่อง และพบว่าร้อยละ 77.6 ในกลุ่ม 1 และ ร้อยละ 97.2 ในกลุ่ม 2 มีการไหลเวียนของหลอดเลือด เบซิลาร์ บกพร่อง ร้อยละ 85 มีการทรงตัวบกพร่อง หลัง 8 สัปดาห์ โดยกลุ่ม 2 ให้บริหารศีรษะ พบว่ากลุ่ม 2 มีผลการตรวจดีขึ้น ในขณะที่กลุ่ม 1 กลับแย่ลง ผู้สูงอายุ ร้อยละ 82.8 ให้ความเห็นว่าแผ่นพับแสดงวิธีการบริหารศีรษะได้ประโยชน์และปฏิบัติเองได้ง่าย

สรุปได้ว่าการเสียการทรงตัวในผู้สูงอายุเป็นเรื่องซับซ้อน เนื่องจากผู้สูงอายุมีโรคเรื้อรังประจำตัวหลายอย่าง นอกเหนือจากการเสื่อมจากวัย แพทย์และผู้เกี่ยวข้องกับผู้สูงอายุจำเป็นต้องเข้าใจปัจจัยร่วมต่าง ๆ และเน้นการดูแลสุขภาพโดยรวมด้วย