• 計畫中文名稱	失智症老人的維生素 B12 營養狀況		
• 計畫英文名稱	Vitamin B12 Nutritional Status in the Elderly with Dementia		
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• 研究人員	蘭淑貞,洪啓宗,黃士懿,邱弘毅,鍾文挺		
• 中文關鍵字	維生素 B12；營養狀況；失智症；老人		
• 英文關鍵字	vitamin B12；nutritional status；dementia；elderly		
• 中文摘要	維生素 B12 爲人體重要營養素之一，其功能參與造血與維持神經系統功能的正常。缺乏而造成的神經病變包括因髓鞘質合成不完全，脊髓等神經系統退化，呈現症狀包括感覺倒錯(paresthesia)，手腳麻木並感到刺痛。振動感(vibration sense)和方位感(position sense)減低。身體站不穩，神經肌肉不協調以致動作不平衡、心智遲鈍、記憶性差、易激動、情緒低潮、神經退化、幻想、甚至精神病(psychosis)。 老年人隨年齡的增加，因爲胃壁細胞退化萎縮，胃液與內因子的分泌有下降的趨勢，因此降低維生素 B12 的吸收而容易有維生素 B12 不足的情形。而失智症老人則是雪上加霜，若未受到良好的飲食營養照顧，更是容易成爲維生素 B12 缺乏症的危險族群。國外一些研究已建議失智症老人應定期追蹤維生素 B12 營養狀況。而國內至今尚無針對失智症老人的維生素 B12 營養狀況之研究文獻報導。 本研究爲三年追蹤性(following-up)、個案控制(case-control) 研究，第一年研究目的是以不同種類與程度的失智症老人爲研究對象，探討他們的維生素 B12 營養狀況，並探討不同智能與維生素 B12 營養狀況的關係。本研究想要詢問及回答的主要問題是不同程度與不同種類失智症老人的維生素 B12 營養狀況不良的比率有多少? 這些失智症老人和一般健康老人的維生素 B12 營養狀況是否有所不同?。研究對象爲在萬芳或北醫附醫先經由神經內科主治醫師的臨床診斷所認定的退化性失智症阿茲海默型(Alzheimer’s Disease, AD)與血管型失智症(vascular disease, VD)的老人且過去兩年內未服用過維生素 B12 補充劑，並以中文版簡易智能狀態量表(mini-mental status examination, MMSE) 主要是魏氏智力測驗（WAIS-III）作爲評估其智能工具，將其智能量化。另外也用此量表篩選出輕度輕度智力受損(mild cognitive impairement, MCI)以及年齡與性別匹配且過去兩年內未服用過維生素 B12 補充劑的健康老人。當 4 組共 60 位受試者(每組 15 人)的條件符合		

	後，取得其家屬或本人的參加研究同意書，之後安排抽血，以評估維生素 B12 的營養狀況，包括血清維生素 B12、血清同半胱胺酸總量 (tHcy)與甲基丙二醯酸(methylmanolic acid, MMA)的測定。血清維生素 B12 是用放射線免疫法檢測，同半胱胺酸則用高效能液態色層分析儀(high performance liquid chromatography, HPLC)測定。血清 MMA 則用氣相色層質譜儀測定，統計分析包括 one-way ANOVA with Student's t tests 與 Spearman's correlation coefficients。預期研究結果是第一年：AD 或 VD 兩種失智症又無補充維生素 B12 之患者其維生素 B12 營養狀況不良的情況最爲很普遍，MCI 組與健康老人組也有維生素 B12 不良的情形。但比 AD 或 VD 兩種失智症老人情況好。而智力受損的維生素 B12 營養狀況介於失智症老人與健康老人之間。在確定任何一組有維生素 B12 缺乏症者，分別給予維生素 B12 皮下注射之介入，第二與三年的目的則是追蹤：在給予維生素 B12 皮下注射之介入後，測試各組受試者隨著時間，智能的退化進展與維生素 B12 營養狀況是否有所延緩或改善。
• 英文摘要	Due to degeneration and atrophy of gastrointestinal wall cells with age, the secretion of gastric juice and intrinsic factor tends to decrease, thus the absorption of vitamin B12 is interfered which results in inadequacy of the vitamin in the elderly. The situation become even more serious among the elderly with dementia, especially when their diet and nutrition is not taken good care of, the elderly with dementia is a high risk for vitamin B12 deficiency. In the US, it's has been suggested to screen vitamin B12 deficiency among the elderly with dementia annually. However, no published work on this issue has been found in Taiwan. This study is designed to be 3 years' follow-up case control study. For the first year, the study purpose is to investigate the vitamin B12 nutritional status of the elderly with different type of dementia and degree of severity of the disease as well. Once any subject has been found to have vitamin B12 deficiency for the first year, intervention (intramuscular injection) of vitamin B will be introduced. For the first year, the study will address two questions: 1. What is the proportion of vitamin B12 deficiency among the elderly with Alzheimer's Disease (AD), vascular dementia (VD), mild cognitive impairment (MCI) or health status (HS). 2. How are vitamin B12 nutritional status and cognitive function correlated among the 4 groups of the elderly ? All subjects (60 in total, 15 for each of 4 groups) will be recruited from at Wan-Fung or Taipei Medical University hospital. AD and VD patients are to be from neuro-internal clinic. Once the patients are diagnosed as AD or VD without vitamin B supplementation during the past 2 years, Then the subject will undergo mini-mental status examination, MMSE), mainly Wais-intelligence test (WAIS-III) usedto differentiate different degree of cognitive impairment. Healthy elderly subjects of age more than 65 years matched with sex serve as control group. The study will be explained to the subjects and the informed consent will be obtained when any subject will agree to participate. Then schedule will be arranged for each subject to withdraw fasting blood in order to determine the nutritional status of vitamin B12 by analyzing serum vitamin B12 (radioimmunoassay), total serum homocysteine (tHcy) [Durrand et al's method] and (methylmanolic acid, MMA) [GC-MS]. One-way ANOVA with Student's t tests will be performed to determine the significant difference of vitamin B12 nutritional status among 4 groups. Spearman's correlation coefficients will be calculated between cognitive function (CF) and vitamin B12 nutritional status. For the 2nd and 3rd year of follow-up, all the assessments including cognitive function and vitamin B12 nutritional status will be reevaluated to determine the efficacy of vitamin B12 intervention. The expecting results of the study are as follows: 1.For the first year,

	the proportion of the subjects who are vitamin B12 deficiency in 4 groups: AD or VA > MCI > healthy elderly. 2.There is an positive correlation between vitamin B12 concentration and CF. However, negative correlations exist between homocysteine and CF; and between MMA and CF. 3.For the 2nd and 3rd years, vitamin B12 intervention is effective to correct deficiency status of the patients and prevents deterioration of cognitive impairment in MCI but not in DA or VA.