

## **Neuropsychology in North Uganda.**

### **What may handcrafts tell us about cognitive functions ?**

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### **Summary**

Diabetes and hypertension are increasing in several developing countries leading in a near future to a significant increase of vascular diseases. In Gulu, Northern Uganda , war and displacement have increased the disease burden. We report here the results on cognitive performances found during an health education program directed towards diabetic and /or hypertensive patients with poor therapeutic compliance and consisting in weekly meetings during which sugar blood and arterial pressure were checked. Patients were encouraged to do several handcrafts comprehending some well known and some new crafts where new elements were introduced, requiring therefore the shifting to new strategies. Patients were taught for one month and then left to operate on their own. Performances were evaluated as: 1) good execution of both tasks 2) good execution of the “old “ but not of the “new” task 3) bad execution of both. It was found that patients with diabetes only and hypertension only had similar results as 34% of patients did well both tasks and the same percentage failed in both. Patients with both diseases performed significantly worst a 48% of them were unable to correctly perform both the well known and the new tasks and particularly failed in these lasts. These results seem to indicate that subclinical brain lesions usually found in middle aged subjects in our areas are leading there to very early cognitive impairments. Prevention programs are therefore strongly needed.

**Keywords:** Diabetes; Hypertension; cerebrovascular diseases

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### Introduction

Diabetes and hypertension are increasing in developing countries as a consequence of a westernized lifestyle ( 1, 2,3 ) and could lead in a near future to significant increase of vascular diseases (4,5,6). Thus improving the patients adherence to therapy and prevention is crucial ( 4,6 ). To this aim the Diabetic Clinic of Gulu Regional Hospital, Northern Uganda, has planned weekly meetings for the hypertensive and diabetic outpatients in the aim of regularly checking their blood sugar levels and arterial pressure . Meetings were based on an activity that the patients ( all young women ) enjoyed much and is part of their cultural background, that is doing handcraft ; the activity also allowed to obtain further information on the cognitive abilities of these patients by evaluating the final results of their work. We hypothesized that patients affected by both pathologies ( hypertension and diabetes ) should demonstrate more difficulties than the other groups in performing tasks requiring to introduce some new element in an already well known context, an aspect we usually find through cognitive tests in our areas in middle aged and old subjects with poor therapy compliance .

### Method and Material

50 women (mean age 35 yrs, mostly illiterate) affected by diabetes, hypertension or both participated to a weekly group activity based on handcrafts doing . The crafts were of two types : "well known" handcrafts, that is those the patients had executed many times before and "new" crafts where new elements were included in a well known framework . The "new" tasks were taught for one month and then patients were left to operate on their own. Three groups were considered : group A ( patients with diabetes only, group B ( patients with hypertension only) and group C (patients with both). Eight crafts were randomly collected from each subject, consisting in four handcrafts of the first type and four of the second. None of the patients had motor nor visual difficulties that might interfere .

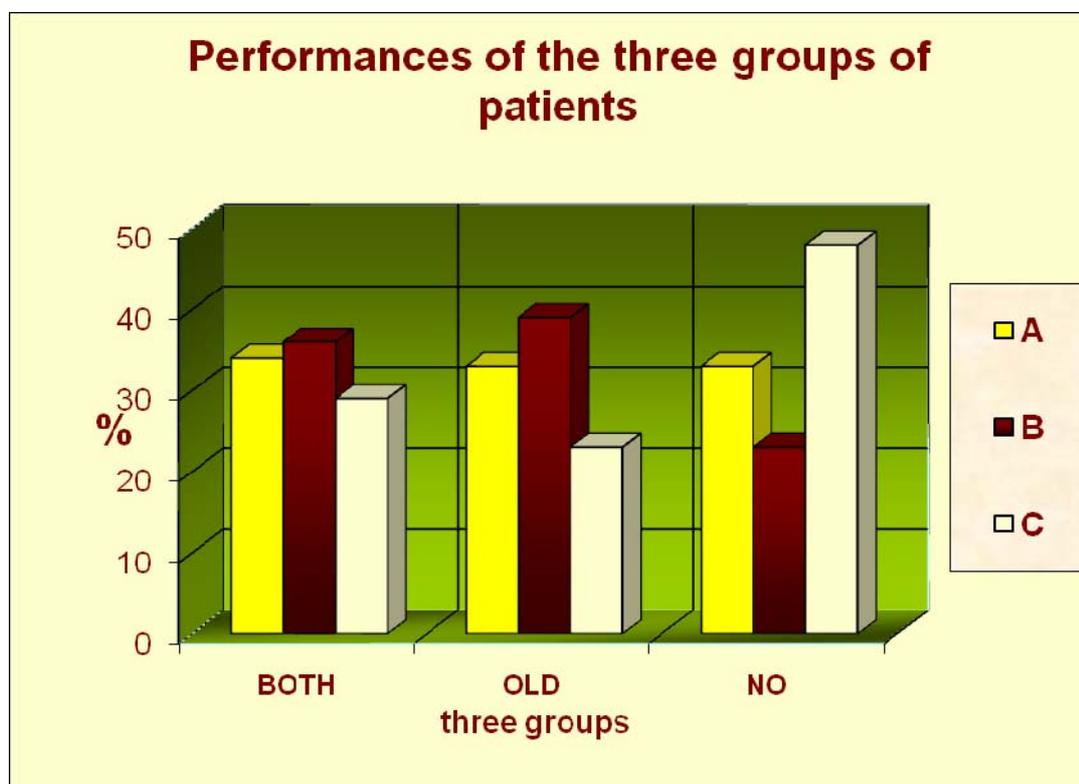
### Results

Table 1: Results obtained in three different tasks.

	A	B	C
Patients able to complete both tasks	34%	36%	29%
Patients able to do the old task only	33%	39%	23%
Patients unable to complete any task	33%	25%	48%

Table 1: Group A: Patients with diabetes only  
 Group B: Patients with hypertension only  
 Group C: Patients with diabetes and hypertension

Graphic 1: Performances of the three groups of patients



A: Patients with diabetes only

B: Patients with hypertension only

C: Patients with diabetes and hypertension

Both : Patients able to complete the old and the new task

Old : Patients able to do the old but not the new task

NO : Patients unable to complete any task

### Discussion

The handcrafts of 50 women affected by diabetes , hypertension or both were evaluated after a training period during which they were taught to execute some well known and some partially new crafts. We found that the patients affected by diabetes only or hypertension only had almost the same impairment in handcrafts doing (as no substantially different performances were found within those groups), while patients showing both pathologies performed significantly worse.

Handcrafts performance requires different abilities such as activity planning, result checking and strategies shifting if a new performances is required.

These abilities are tied with frontal circuits, that is the network involved in the mental representation of the task, its planning and employing new strategies (7). The significantly worst results obtained by patients with both pathologies might be attributed to some subclinical ischemic lesions in the

frontal areas leading to a cognitive dysfunction . These lesions of are commonly found by MRI in middle aged and old diabetic and hypertensive subjects whose neuropsychological tests demonstrate the impairment of some executive functions (8,9). This kind of impairment is furthermore predictive of the development of vascular dementia. In the population we have studied and where no brain imaging methods are available , the very young subjects age suggests that the diagnosis delay and the poor therapy compliance lead to brain dysfunctions very early , long time before what is expected , stressing therefore the necessity of developing as most as possible programs to improve health education.

### **Conclusions**

Chronic diseases are a terrible burden for developing countries and prevention has major role in fighting them . In spite of the limited resources some interventions are however possible . Through them useful information may be achieved and prevention programs should be planned . This study offers an example of such an approach.

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