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Epidemiology of Parkinson's disease in Libya

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Abstract
Background: Parkinson's disease is characterized by dopaminergic neuronal loss in the substantia nigra at the central nervous system (CNS), a significant reduction in dopamine levels, and the presence of Lewy bodies Lewy bodies are composed of abnormal deposits of protein aggregates, particularly synuclein proteins. While the main etiology of the disease has yet to be determined. Environmental, occupational and genetic factors seem to play important roles Risk factor studies have pinpointed age, gender, occupation, area of residence, smoking, coffee/tea consumption, drinking well-water and being exposed to herbicides/pesticides. The prevalence of Parkinson's disease varies among ethnic and geographic groups around the world, being very low in countries of the far eastern asia and high in latin America, and varies in some areas in north africa and europe.
Materials and Methods: An estimated 1%-2% over the age of 65 years are affected and more than 4% of the population by the age of 80 years. Information on socioeconomic background, diseases, medications and lifestyle was collected via questionnaires and interviews. History including age, sex, education, community population, occupation, coffee consumption, body mass index (BMI) {height and weight were measured, and the body mass index (kg/m2) was calculated.
Results: The prevalence of Parkinsonim in this population was low, 44.12/100,000, while the prevalence in the age group above 60 years was 377.41/100,000. Below this age, the prevalence was low, 14.37/100,000. Parkinsonim prevalence was higher in males than in females (ratio 1.6:1); The prevalence was found to be higher in people who are living in rural areas, where most work in agriculture.The prevalence of Parkinsonim was low for residents living in the in the south (18.45/100,000) and higher to a lesser extent in the west (47.84/100,000), but was much higher in the east (61.22/100,000).
Conclusion: In conclusion we found a high prevalence of Parkinsonim in the eastern area mainly in Benghazi, Al-Marg, Beida, Sussa, where the adult residents are agricultural workers. Epidemiological studies have pointed to an increased risk of Parkinsonim in farmers and agricultural workers those who continuously exposed to herbicides and pesticides. However, no conclusion has been drawn as to the specific agents that may be responsible.

Keywords: Epidemiology, Parkinson's, Dopaminergic, Environmental

Introduction

The etiology of the Parkinson's disease has yet to be determined, environmental, occupational and genetic factors seem to play important roles. The prevalence of Parkinson's disease varies among ethnic and geographic groups around the world, being very low in countries of the far eastern asia and high in latin America, and varies in some areas in Africa and Europe [1]. Several epidemiological studies have been done to find non-genetic risk factors, but most of them were small and methodologically limited. Larger, well-designed prospective cohort studies have only recently reached a stage at which they have enough incident patients and person-years of follow-up to investigate possible risk factors and their interactions. In this article, we review what is known about the prevalence, incidence, risk factors, and prognosis of PD from epidemiological studies [2].

The rate of crude PD prevalence was found to be as low as 15/100,000 in China and as high as 657/100,000 in Argentina [3, 4, 5]. Incidence of PD is showing rise in past four decades according to studies in china and finland [3, 6]

Ashok *et al.* reported a crude prevalence rate of 31.4/100,000 in Benghazi (north-eastern Libya) [7]. Al Rajeh *et al*., in a study conducted in Thugbah, Saudi Arabia, found a crude prevalence rate of 22/100,000, [8] while Attia Romdhane *et al*. found the prevalence of Parkinson's disease in Kelibia, Tunisia, to be close to that in the other two studies [9].

An estimated 1%-2% over the age of 65 years are affected and more than 4% of the population by the age of 80 years [10].

Some of the risk factors for which we have found some evidence of an association with PD. For the most part, it is too soon to make recommendations for how to prevent Parkinson's based on this research. However, these results may help us to understand the causes of PD, and provide direction for future research and therapy development [11].

Risk factor studies have pinpointed age, gender, occupation, area of residence, smoking, coffee/tea consumption,

drinking well-water and being exposed to herbicides/pesticides [12].

Material and Methods

To estimate the prevalence of PD in Libyan population, using the screening of clinical records and certificates, and drug tracer methodology, utilizing the consumption of L-dopa to calculate the prevalence of PD.

The study was carried out in a Libyan population living in a well-defined geographic area of Libya, approximately 4,451,583 residents, Persons who are eligible for inclusion in this study must be resident not less than one year or had the disease for at least 1 year if the area of residence has been changed.

Patients with PD were identified upon presentation to a neurology outpatient unit either at hospital or private. All patients with Parkinson's disease, defined by the presence of bradykinesia and at least one of the following:

rigidity, tremor or postural instability, entered the study. Evaluation of patients included a standardized questionnaire and detailed neurological examination by a experienced neurologist. Careful pedigree evaluation were performed.

Psychiatric problems were diagnosed by psychiatrists. And any other medical problem confirmed by a specialist. Patients were recruited with their prior written informed consent and ethical committee approval.

Every patient has the following information i.e., geographical and ethnic origin, sex, age, place of birth, age at onset and duration of the disease, disease course from onset, medical history, dose and duration of antiparkinsonian treatment. Family history of Parkinson's disease was considered positive if it was reported for at least one parent or sibling. Extensive pedigrees were constructed for all familial and sporadic cases. The sporadic cases made up a control group for familial cases. Families were classified as single generation families when all affected members belonged to only one generation and multigenerational when affected members spanned more than one generation (familial). patients were grouped as Juvenile onset (JO; age of onset (0–20) years), Early onset (EO; (20–50) years) and late onset (LO; >50 years).

Results

The prevalence of PD in this population was low, 44.12/100,000, while the prevalence in the age group above 60 years was 377.41/100,000. Below this age, the prevalence was low, 14.37/100,000. PD prevalence was higher in males than in females (ratio 1.6:1); The prevalence was found to be higher in people who are living in rural areas, where most work in agriculture. The prevalence of PD was low for residents living in the in the south (18.45/100,000) and higher to a lesser extent in the west (47.84/100,000), but was much higher in the east (61.22/100,000).

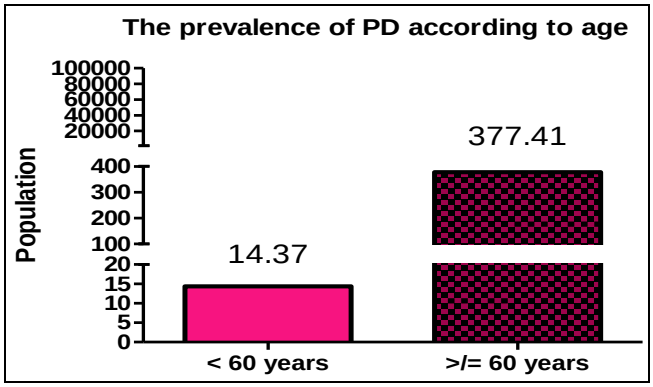

Fig 1: The relationship between the prevalence of Parkinson's disease and age.

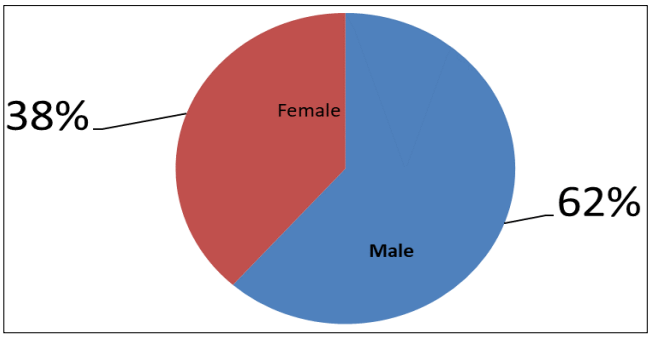

Fig 2: The percentage prevalence of P.D. according to sex.

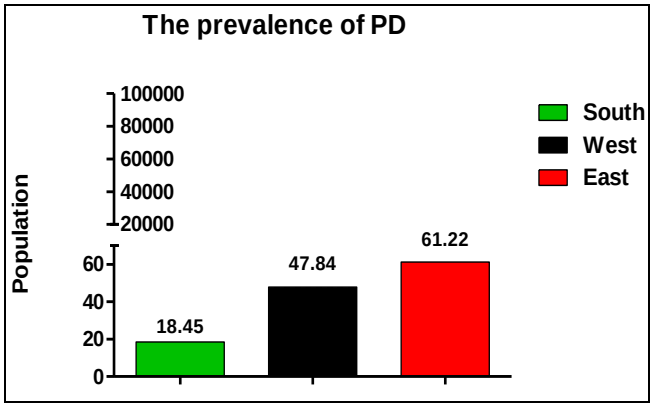

Fig 3: The prevalence of P.D. in different parts of Libya.

Discussion

The overall crude prevalence of PD in the Libyan population, 44.12/100,000, was as low as 43/100,000 and equal to that reported by Attia Romdhane *et al*. in Tunisia [9]. However, this prevalence was higher than the 27/100,000 reported by Al Rajeh and colleagues in the Saudi Arabia [8]. Libyan incidence and prevalence is relatively low when we compared studies elsewhere, similar study in USA done in California, Minnesota, and Ontario and the US population structure from 2010 and estimated the overall prevalence of

PD among those aged ≥45 years to be 572 per 100,000 with 95% confidence interval of 537–614 [13]. We assume that the prevalence of PD in our study might be an underestimate, since active case finding efforts in communities detect as many as 10–40% due to the current situation previously.

We assume that some patients suffering from predominantly akinetic PD were missed from our study. However, the causes of variation in the prevalence of PD in the different countries are still a matter of speculation. Although differences may be related to genetic, occupational or environmental factors, they may also be related to other factors, such as the use of different methodologies and diagnostic criteria in various studies. Epidemiological studies showed that men are at a greater risk of being afflicted with PD than are women There is no explanation for the increased risk in males [14].

Conclusion

We found a high prevalence of PD in the eastern area mainly in Benghazi, Al-Marg, Beida, Sussa, where the adult residents are agricultural workers. Epidemiological studies have pointed to an increased risk of PD in farmers and agricultural workers Moreover, these areas are surrounded by large fields, where the population is continuously exposed to herbicides and pesticides dispersed in the air by spray jet tracks also manually sprayed cars. Different studies showed that people exposed to pesticides have an increased risk of developing PD. However, no conclusion has been drawn as to the specific agents that may be responsible.

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