Comparison the effects of Gabapentin and Propranolol in Patients with essential tremor

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Abstract

Introduction: Essential tremor is the most common abnormal movement in the world. There is no associate neurologic abnormality. Tremor in this disease has low frequency and its prevalence is 3 to 5 percent in community.

Methods: This prospective study was conducted on 120 patients with essential tremor in neurology clinic of shahid mostafa Khomeini hospital (shahed university) from 2005 to 2008. Patients assigned randomly in two groups. 59 patients received propranolol 40 mg 3 times daily for 3 weeks and 61 patients in another group received gabapentin 300 mg 3 times daily for the same duration. Fahn – Tolosa-Marin tremor rating scale (TRS) that is a numerical scale (0-88) was used for evaluation in both groups.

Results: 120 patients completed the study. 56 (47%) patients were male and 64 (53%) patients were female. Mean age was 43.9 (26-59) years old. At the beginning of study the TRS was 38.6±1 and 39.1±1 in patients taking propranolol and gabapentin respectively. At the end of study TRS was 28.4±1 and 25.6±1 in propranolol and gabapentin group respectively. Statistical analysis with SPSS software showed significant difference in both group after treatment. (P<0.0005)

Conclusion: Gabapentin can be used as an effective drug in the treatment of essential tremor it's efficacy is at least equal to propranolol. Due to its lower side effects and better tolerance especially in patients with cardiac and respiratory problems and in older patients this drug can be as the first selection in these patients.

Keywords: Tremor, Gabapentin, Propranolol, Abnormal movement

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Introduction
The term essential tremor has been in regular use since the second half of 20th century, but Burressi used it for the first time in 1874. Essential tremor is the most common abnormal movement in the world its pathophysiology is unknown. There is some belief that this disease is under diagnosed and many patients with this disease don't receive adequate treatment. This type of tremor has low frequency. There is no other neurologic abnormality in this disease and all of the neurologic exam is normal. The inheritance of disease is autosomal dominant with high penetration. Essential tremor mostly begins in the arms but may diffuse to other parts and in some patients it appears as head tremor. Both sexes are affected it's prevalence is estimated 415 per 100000 population in one study and in other studies it's prevalence have been reported 3/09 to 5 percent. Etiology of essential tremor is unknown, three associated loci have been found but genes have not been identified. It often has been considered as a degenerative disorder. Some patients have cerebellar ataxia and degeneration of purkinje cells are sometimes find in patients who receive any drugs which may affect tremor, such as acetyl choline, neuroleptics, lithium, cortico steroids and thyroid hormone supplements, anticonvulsant medication, antidepressants, and drugs used for asthma. All patients with essential tremor feel symptoms subside after alcohol drink but it is temporary.

propranolol and primidone are other drugs that are effective but their overall effectiveness is not more than 50-60 percent in more studies. New drugs such as topiramate and gabapentine are under investigation. This study is designed to compare the effectiveness of gabapentin in comparison with propranolol in patients with essential tremor.

Methods
This prospective study performed from 2005 to 2008 in neurology clinic in Mostafa Khomeini hospital (shahed university). Patients were selected in two groups sixty four patients in group G were treated with gabapentin and sixty patients in group P were treated with propranolol. Selected patients had essential tremor for at least 18 months. All patients between 25 to 60 years old selected randomly in two groups. All patients had symmetrical tremor in upper limbs although tremor of other body parts might be present. Patients with asthma, cardiac failure and diabetes mellitus were excluded. All patients who received any drugs which may affect tremor, such as acetyl choline, neuroleptics, lithium, cortico steroids and thyroid hormone supplements, anticonvulsant medication, antidepressants, and drugs used for asthma were not permitted in this study. Patients in group G took...
gabapentin 300mg 3 times daily. Initial dose was 300mg daily raised by 300mg every three day to maximum dose of 1200mg daily. Patients in group P received propranolol 40mg three times daily. All patients received drugs for 3 weeks. for evaluation tremor in our patients we used from Fahn-Tolosa-Marin tremor rating scale (TRS) that is a standard scale for evaluation of tremor in clinical medicine this scale has (0-88) points and higher points shows more disability .(23) All patients evaluated at the beginning of study before taking any drug and at the end of study. Study was described for all patients and all patients had informed consent. If there was any drug hypersensitivity or drug reaction study was discontinued. All the data analyzed with SPSS soft ware at the end of study.

Results
In group P (taking propranolol) 59 patients completed the study and in group G (taking gabapentin) 61 patients completed the study. One patient in group G had drug reaction and one had sleepiness that both of them excluded from study. There was 33 (56%) males and 26(44%) female in group P and in group G there was 31 (51%) male and 30(49%) female. Mean age of patients in group P was 43.3(26-59) years old and mean age in group G was 44.6(27-58) years old. Mean height in group P was 171.3(159-183) cm and mean height in group G was 169.8(165-186) cm. Mean weight in group P was 79.5(66-97) kg and mean weight in group G was 72.3(65-99) kg. At the beginning of study Fahn-Tolosa-Marin tremor rating scale (TRS) in group P was 38.6±1(29-41) and in group G it was 39.1±1( 29-44) . Statistical analysis shows no difference between two groups at the beginning of study. At the end of study TRS scale in group P was 28.4±1( 22-31) and statistical analysis shows significant difference in comparison with beginning of study .(P<0.0005) In group G TRS at the end of study was 25.6±1( 22-30) and statistical analysis shows significant difference in comparison with beginning of study.(P<0.0005)
Discussion

Gabapentin is an antiepileptic drug with a structure similar to GABA which penetrates to blood brain barrier.\(^{(24};\ 25)\) Gabapentin does not interact with other drugs and does not induce liver enzymes and it is well tolerated in elderly and patients with asthma or cardiac problems.\(^{(21};26;27)\) The origin of essential tremor is unknown but a central mechanism is possible. Increased excitability of cell membrane in motor cortex is possibly the underline disorder. Innervations in muscles have reciprocal form and increased excitability of cell membrane produce some oscillations that its presentation in clinic is tremor.\(^{(4};28)\)
Electrophysiological studies also consistent with a central source of tremorogenic oscillation and inferior olive and cerebellum are involved in studies with PET scan. Gabapentin as we mention have inhibitory effect like GABA so it can stabilize the cell membrane and inhibit the oscillatory effect of the unstable cell membrane and suppress tremor with this mechanism. This study shows us that gabapentin can be at least as effective as propranolol in treatment of essential tremor.

Statistical analysis between two groups shows no significant difference between group G and group P at the beginning of study but at the end of study statistical analysis shows significant difference in both groups in comparison with starting score. Although gabapentin is more expensive but it has very low side effect and can be used safely in elderly and also in patients with respiratory and cardiac problems who can not use beta – blockers. This study supports Ondo and Gironell studies. In these studies they found gabapentin as an effective treatment for essential tremor. Although in most review articles propranolol and primidone are introduced as first choice for treatment but both of them have some complications and also their effectiveness rate is low so further investigation in this disease is needed.

According to this study we suggest gabapentin as an effective drug for reduction of tremor in patients with essential tremor especially in older patients.

Reference
بررسی مقایسه‌ای تاثیر پروپرائولول با گابایپنتین در بیماران مبتلا به لرزش فامیلیال

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چکیده

زمینه و هدف: لرزش فامیلیال شایعترین اختلال حرکتی در جهان است. پاتوفیزیولوژی این ناشی از اختلال نورولوژیک است که در دو گروه ناشی از عوامل فیزیولوژیکی یا عوامل نورولوژیکی تشخیص داده می‌شود. این ابتدا از میزان ۴۰۰۰ میلی‌گرم گرم ۳۲ در روز به مدتها ۳ هفته قرار دارا شده‌اند. داشته‌اند و ۱۰۰ درصد از بیماران نیز به همین مدت تحت درمان با گابایپنتین با میزان ۳۰۰۰ میلی‌گرم ۳۲ در روز قرار داشته‌اند که یک میقیاس عدیدی استاندارد (۱۲۰) برای Fahn-Tolosa-Marin (TRS) گیری انجام پذیراست.

روش بررسی: این مطالعه در سال‌های ۱۳۸۴-۲۰۱۳ در بیمارستان بیمارستان شهید مصطفی خمینی بر روی ۲۰۰ بیمار مبتلا به لرزش فامیلیال صورت گرفته‌است. هدف انجام این مطالعه است بررسی تاثیر درمان با پروپرائولول و گابایپنتین در دو گروه ناشی از عوامل فیزیولوژیکی یا عوامل نورولوژیکی تشخیص داده می‌شود.

مباحثه‌ها: در نهایت ۲۰۲ بیمار مطالعه را به پایان رساندند از این تعداد ۷۶ درصد بوده است. در ابتدا درمان میقیاس TRS انجام شده و در جهت دارمیا با پروپرائولول ۲۶ و دارمیا تحت درمان با گابایپنتین ۲۶ انجام گرفته است. در انتهای درمان این اعداده ۵۵ و ۵۵ تفاوت معنی‌دار در هر دو گروه در مقایسه بین شروع و پایان مطالعه را نشان می‌دهد.

نتیجه‌گیری: گابایپنتین به عنوان یک داروی موتور در درمان لرزش فامیلیال بوده و میزان انرکشی آن حداکثر با پروپرائولول برای می‌کند. با توجه به عوارض کمتر این دارو و نداشتن عوارض قلیبی عروقی و تنفسی و تحمل بهتر آن در این موارد بخصوص در افراد مسن می‌تواند در این موارد به عنوان داروی انتخابی نیز مطرح گردد.

واژگان کلیدی: لرزش، گابایپنتین، پروپرائولول، اختلالات حركتی

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