Methodist Hospital

Struthers Parkinson's Center

# GAIT AND BALANCE INITIATIVE (GABI): RESULTS OF FALLS DIARY, GENDER AND MEASURES OF ANXIETY, BALANCE CONFIDENCE AND BALANCE

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## OBJECTIVE

To design methodology for assessing attributes and risk factors of falls in Parkinson's disease.

## BACKGROUND

Falls in persons with Parkinson's disease (PD) and other parkinsonian movement disorders is a significant cause of morbidity and decline in quality of life. This study applies a multidisciplinary strategy with an interdisciplinary perspective using a broad range of assessments tools to address the relationship between the number of falls and demographic and clinical measures. Assessments evaluate cognition, balance, gait, mood, symptomatology, activities of daily living, fatigue, and balance confidence. Assessments are functional, can be completed during routine clinic visits, and are applicable to any practice setting. This study will provide validation studies of physical therapy measures in Parkinson's disease, a PD-specific balance assessment tool, and a PD Falls Risk Assessment Toolkit. Using information obtained from this study, the tool and toolkit would then be used as outcome measures in testing interventions for falls prevention in a multi-center study.

## METHODS

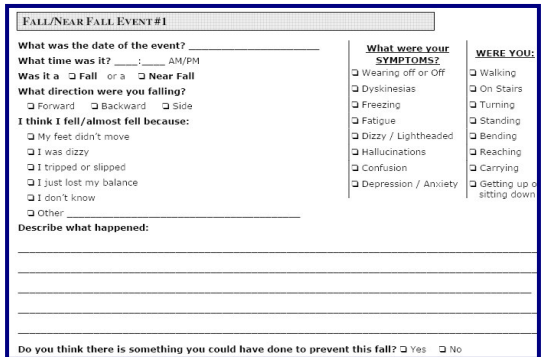
**Study Design:** Cross-sectional study utilizing a falls diary completed by Parkinson's disease patients with assessments at diary completion.

**Study Population:** Parkinson's disease patients attending a movement disorder clinic (Hoehn-Yahr stages II-IV).

**Diary:**
Diary was completed for each fall and near-fall during a four-week period. Information completed for all fall/near fall events: date, time, and type (fall, near fall). The first 10 events had additional information collected:
- on/off
- direction (forward, backward, side)
- symptoms experienced (wearing off, dyskinesias, freezing, fatigue, dizzy/lightheaded, hallucinations, confusion, anxiety/depression)
- activity at time of event (walking, standing, bending, on stairs, reaching, turning, carrying, getting up/down)
- description of fall/near-fall

Instructions and definitions are discussed with the patient at the time of consent and included in the diary.

### Falls Diary



FALL/NEAR FALL EVENT #1

What was the date of the event? _____
What time was it? ____:____ AM/PM
Was it a ❑ Fall or a ❑ Near Fall
What direction were you falling?
❑ Forward ❑ Backward ❑ Side
I think I fell/almost fell because:
❑ My feet didn't move
❑ I was dizzy
❑ I tripped or slipped
❑ I just lost my balance
❑ I don't know
❑ Other _____

What were your SYMPTOMS?
❑ Wearing off or Off
❑ Dyskinesias
❑ Freezing
❑ Fatigue
❑ Dizzy / Lightheaded
❑ Hallucinations
❑ Confusion
❑ Depression / Anxiety

WERE YOU:
❑ Walking
❑ On Stairs
❑ Turning
❑ Standing
❑ Bending
❑ Reaching
❑ Carrying
❑ Getting up o sitting down

Describe what happened:
_____
_____
_____
_____
_____

Do you think there is something you could have done to prevent this fall? ❑ Yes ❑ No

## METHODS – continued

**Assessments:**
- Demographics: age at assessment, gender, year of PD diagnosis
- Beck Anxiety Inventory (BAI) – total score, higher scores indicate higher anxiety
- The Activities-specific Balance Confidence Scale (ABC) – total score, higher scores indicate higher confidence
- Physical Therapy: Berg Balance Scale (BBS) – BBS is a measure of balance, with score based on the length of time a position can be maintained, length of time to complete a task, and the distance the arm is able to reach forward; total score, higher score indicates less impairment.

**Statistics:**
- Pearson correlation coefficient, T-test (with correction for unequal variances, as appropriate) and Mann-Whitney-Wilcoxon; significance set at p-value ≤.05. Values are presented as mean±standard deviation.

## RESULTS: Phenomenology

Diaries have been well received by subjects and compliance was high. Diaries were completed by 338 subjects: 69 (20%) of the subjects had no falls or near falls during the four-week study period while 269 reported a total of 1,833 events (41% falls and 59% near falls); 85 (32%) experienced only near falls, and 45 (17%) only falls. Detailed information was available for 1,382 events:
- Direction: 45% forwards, 26% backwards, 29% sideways. Backwards was more common in falls (p<.001) and sideways more common in near falls (p=.03).
- Associated symptoms: Wearing off (27%), fatigue (24%), freezing (21%), dizziness (15%), dyskinesias (5.0%), confusion (4.6%), depression/anxiety (3.7%), and hallucinations (1.5%). Dizziness (p<.001) and depression/anxiety (p=.02) were more common in near falls.
- Associated activities: Walking (41%), standing (27%), reaching (22%), getting up/down (15%), carrying (14%), turning (11%), bending (10%), and walking up or down stairs (8%). No difference was detected between falls and near falls with regard to activity at the time of the event.

## CONCLUSIONS

Phenomenology: Near falls are more frequent than falls among PD patients, but falls and near falls have minimal differences in terms of associated symptoms and activities.

Gender Differences: Risk factors commonly associated with falls and near falls in PD are significantly higher in females compared to males. This increased risk does not result in a greater number of falls, near falls, or total falls/near falls for females. It is unclear why increased risk does not translate into increased events for females.

Interaction of Anxiety, Balance Confidence and Balance with Falls and Near Falls: Falls were associated with disease duration, BBS and ABC. Near Falls were associated with BAI and ABC. BAI, BBS and ABC were highly correlated with each other.

## RESULTS: Gender Differences

| | Female (n=157) | Male (n=185) | P-Value |
|---|---|---|---|
| **Age** | 71.6±9.4 | 71.5±8.6 | NS |
| **Disease Duration** | 9.7±6.5 | 9.7±7.0 | NS |
| **BAI** | 17.6±10.5 | 14.4±8.8 | .004 |
| **ABC** | 87.3±36.0 | 100.1±36.4 | .001 |
| **BBS** | 41.8±12.2 | 44.2±12.1 | .010 |
| **Falls** | 1.9±3.4 | 2.3±5.9 | NS |
| **Near Falls** | 3.0±6.2 | 3.2±5.1 | NS |
| **Total Falls/Near Falls** | 5.0±7.1 | 5.5±8.4 | NS |

## RESULTS: Interaction of Anxiety, Balance Confidence and Balance with Falls and Near Falls

| | **Age** (71.4±9.3 years) | | **Disease Duration** (10.0±6.9 years) | |
|---|---|---|---|---|
| | Correlation | P-value | Correlation | P-Value |
| **BAI** (15.9±9.8) | -0.116 | 0.037 | 0.118 | 0.034 |
| **ABC** (94.1±36.7) | -0.216 | <.001 | -0.169 | 0.002 |
| **BBS** (43.1±12.2) | -0.357 | <.001 | -0.192 | 0.001 |
| **Falls** (2.1±4.9) | 0.004 | NS | 0.141 | 0.01 |
| **Near Falls** (3.1±5.6) | 0.002 | NS | 0.045 | NS |
| **Total Falls/Near Falls** (5.2±7.8) | 0.004 | NS | 0.121 | 0.027 |

| | **BAI** | | **ABC** | | **BBS** | |
|---|---|---|---|---|---|---|
| | Correlation | P-value | Correlation | P-Value | Correlation | P-Value |
| **Falls** | .087 | NS | -.170 | .002 | -.219 | <.001 |
| **Near Falls** | .129 | .021 | -.146 | .009 | -.029 | NS |
| **Total Falls/Near Falls** | .147 | .009 | -.210 | <.001 | -.159 | .005 |

***Supported by a grant from the National Parkinson Foundation***