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Letter to the Editor and Authors' Response

DELIRIUM AND FUNCTIONAL RECOVERY IN ELDERLY PATIENTS

To the Editor:

In their article recently published in the Journal, Kiely and colleagues (1) found that resolution of delirium among postacute care patients appears to be a prerequisite for functional recovery. We want to contribute to this topic with our own personal data, referring to the experience in detecting and managing delirium in our Rehabilitation and Aged Care Unit (RACU). From June 1, 2004 through January 31, 2006, 116 patients 65 years old or older were admitted to our RACU with a diagnosis of delirium ascertained on admission. Of these patients, 12 died during RACU stay and 36 were transferred to acute hospitals for severe instability of clinical conditions. We here present the data about the remaining 58 patients who were followed during RACU stay. Sources of admission were orthopedic (n = 24, 41.4%) or medical (n = 14, 24.1%) wards, and 20 individuals (34.5%) came from home. Delirium was ascertained by two experienced geriatricians (G.B. and S.S.), using the Confusion Assessment Method (2). On admission, at resolution of delirium, and at discharge, patients were evaluated with the Tinetti scale (3) and the Trunk Control Test (TCT) (4), in addition to the geriatric multidimensional assessment. Criteria for discharge included: (a) patient or caregiver request to return home; (b) full recovery of the preadmission functional status, based on proxy reports with reference to 1 month before admission (for nonsurgical patients) or prior to the acute event (for surgical patients); (c) partial recovery of the preadmission functional status but inability, according to RACU staff and caregiver opinions, to further improve functionally; (d) reaching the maximum length of RACU stay (35 consecutive days), as established by the Regional Health Care System for surgical and non-neurological patients.

For all individuals, delirium was due to a mix of precipitating factors, including surgery, acute medical illnesses (pneumonia, urinary tract infections, heart failure), dehydration, and stool or urine retention. Because duration of delirium was heterogeneous among individuals, we divided the sample into three groups according to the duration of delirium (1 week or less, n = 15; 1–2 weeks, n = 25; or longer than 2 weeks, n = 18). To assess the mean functional recovery for each day of RACU admission without delirium, we created an index (Index of Functional Recovery After Delirium, IFRAD) estimating the difference in the scores at functional scales (Tinetti score and TCT) from resolution of delirium to discharge divided by the duration of RACU stay without delirium (days).

Table 1 shows that patients with delirium resolution after 2 weeks were more cognitively impaired than were patients in the other two groups. Furthermore, although not significantly, they also had a higher comorbidity score and lower functional performances.

By comparing the TCT IFRAD scores among the three groups, we observed that functional recovery for each day of RACU admission without delirium was inversely correlated with duration of delirium (i.e., the lower the duration of delirium, the higher the TCT functional

Table 1. Characteristics of 58 Patients With Delirium (Stratified by Duration of Delirium) on Admission to a Rehabilitation and Aged Care Unit

Characteristics	Delirium Resolution ≤ 1 Week (N = 15)	Delirium Resolution 1–2 Weeks (N = 25)	Delirium Resolution ≥2 Weeks (N =18)	p
Age, y	81.7 ± 5.3	83.2 ± 5.1	82.8 ± 8.1	.78
Women, n (%)	9 (60.0)	18 (72.0)	13 (72.2)	.68
Charlson comorbidity index	2.7 ± 2.7	3.0 ± 2.0	3.5 ± 2.5	.56
Albumin serum level, g/dL	2.9 ± 0.6	2.9 ± 0.4	2.8 ± 0.3	.86
C-reactive protein	5.2 ± 5.4	5.7 ± 5.6	5.9 ± 6.1	.93
Mini-Mental State Examination (0–30)	21.1 ± 6.4	16.6 ± 6.8	14.9 ± 6.2	.03
Barthel Index on admission (0–100)	41.9 ± 26.0	33.9 ± 22.8	28.6 ± 24.4	.30
Trunk Control Test on admission (0–100)	46.7 ± 32.0	41.4 ± 27.5	38.5 ± 37.0	.76
Trunk Control Test at resolution of delirium (0–100)	66.7 ± 25.3	64.3 ± 30.1	68.2 ± 27.6	.89
Trunk Control Test at discharge (0–100)	83.7 ± 21.5	71.8 ± 25.9	68.9 ± 27.0	.22
Tinetti Score on admission (0–28)	9.0 ± 6.3	7.1 ± 7.6	5.7 ± 6.5	.42
Tinetti Score at resolution of delirium (0–28)	14.5 ± 4.4	14.0 ± 7.7	12.1 ± 7.1	.53
Tinetti Score at discharge (0–28)	18.7 ± 4.5	16.0 ± 6.7	13.3 ± 6.5	.05
Delirium duration, d	4.3 ± 1.4	9.1 ± 2.0	18.5 ± 4.6	.000
Length of stay without delirium, d	19.2 ± 6.7	15.3 ± 9.0	11.0 ± 6.8	.016
Total length of stay, d	24.3 ± 6.8	24.7 ± 8.6	30.4 ± 6.9	.03
IFRAD Trunk Control Test	0.9 ± 0.9	0.3 ± 0.6	0.03 ± 0.1	.003
IFRAD Tinetti score	0.22 ± 0.1	0.15 ± 0.2	0.09 ± 0.1	.22

Note: IFRAD = Index of Functional Recovery After Delirium (calculated as the difference in Trunk Control Test or Tinetti score from resolution of delirium to discharge divided by the length of stay [days] without delirium).

recovery). The Tinetti IFRAD score was also lowest in individuals with longer durations of delirium, and vice versa, although not significantly.

Our data only partially agree with the findings of Kiely and colleagues. We support the notion that later delirium resolution is associated with poor functional recovery, but we are not sure that early recognition and treatment of delirium will necessarily result in good functional recovery among all individuals. Because the strategies for management of delirium were standardized in our RACU, the observation that delirium persisted differently among individuals suggests that it could reflect different biological substrates. We hypothesize that delirium lasting more than 2 weeks may be a marker of frailty reflecting the patient's inability to recover premorbid functional status despite clinical efforts.

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References

1. Kiely DK, Jones RN, Bergmann MA, Murphy KM, Orav EJ, Marcantonio ER. Association between delirium resolution and functional recovery among newly admitted postacute facilities patients. *J Gerontol Biol Sci Med Sci.* 2006;61A:204–208.
2. Inouye SK, Van Dyck CH, Alessi CA, Balkin S, Siegal AP, Horwitz RI. Clarifying confusion: the Confusion Assessment Method. *Ann Intern Med.* 1990;113:941–948.
3. Tinetti ME, Speechley M, Ginter SF. Risk factors for falls among elderly persons living in the community. *N Engl J Med.* 1988;319: 1701–1707.
4. Franchignoni FP, Tesio L, Ricupero C, Martino MT. Trunk control test as an early predictor of stroke rehabilitation outcomes. *Stroke.* 1997; 28:1382–1385.