no Part D adjudication (PME records with no matching PDE claims) were identified.

RESULTS

Part D enrollees in the MCBS sample filled 77,468 prescriptions for drugs on the Wal-Mart list in 2007 (Table 1). Nearly half the fills were for cardiac drugs (38,061), followed by anti-inflammatory agents (8,207), vitamins (5,423), and antidiabetic drugs (5,411). Only 4,978 (6.4%) were cash only, and just 563 of these (11.3%) were for $4. The most commonly filled $4 prescriptions were for cholesterol-lowering agents (34%) and antidiabetes drugs (24%). No $4 drugs were filled in the asthma and gastrointestinal classes. Almost 90% of the $4 transactions were adjudicated through beneficiaries' Part D plans. Five hundred sixty cash-only prescriptions that were not Part D adjudicated were identified, representing an overall missingness rate of less than 1%. Only 16 of the missing transactions were $4 fills.

DISCUSSION

This analysis of the MCBS found virtually no evidence of nonadjudicated out-of-plan use of discount generics for Medicare Part D enrollees in 2007. This is good news or bad news depending on one's perspective. The good news is that Part D plans had records for almost all $4 cash-only prescriptions on the Wal-Mart list. These fills would thus count toward true out-of-pocket cost. It cannot be determined from the MCBS whether the recording was the result of claims submitted by discounters or beneficiaries themselves. Only in the former case would Part D plan drug utilization review software routinely evaluate these prescriptions. These findings are also good news for researchers because they remove a lingering doubt about the completeness of Part D PDE record keeping. The bad news is that little evidence was found that Part D enrollees made much use of the $4 discount generics offered by Wal-Mart and other chains in 2007. One study[1] found that 5.9% of adults interviewed for the Medical Expenditure Panel Survey used a $4 program in 2007. The corresponding figure in the current sample was just 3.2% (results not shown).

Many Medicare beneficiaries can achieve savings from discount generic programs. These plans have expanded considerably since 2007, and it is entirely possible that utilization rates are higher now. Part D program offerings have evolved as well, including plans with "preferred generics" selling for as little as $2.[3] How these changes have affected Part D enrollee purchasing behavior since 2007 deserves further study.

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TOTAL BODY WATER IN ELDERLY ADULTS—ASSESSING HYDRATION STATUS BY BIOELECTRICAL IMPEDANCE ANALYSIS VS URINE OSMOLALITY

To the Editor: Dehydration is the most common fluid disorder. It is responsible for morbidity and mortality and accounts for substantial hospital expenditures. Early diagnosis is sometimes difficult because the classical signs may be absent or misleading in older adults. In acutely ill older adults, anthropometric estimates of total body water (TBW) do not reliably reflect fat-free mass because of disturbances of intracellular water (ICW) caused by protein malnutrition, changes in TBW, and changes in the ratio of ICW to extracellular (ECW) because of injury and inflammation.[1] Excessive fluid retention in the extracellular space causes greater morbidity in acutely ill individuals. Bioelectrical impedance analysis (BIA) has been shown to predict TBW in acutely ill elderly adults.[2] Urine osmolality (U Osm) has also been used to estimate hydration status[3–5] but has not been independently validated to predict TBW. This study examined the relationship between TBW predicted using BIA, U Osm, and clinical criteria including hospitalization status, severity of illness (Acute Physiology And Chronic Health Evaluation (APACHE) score), intravenous fluid or diuretic administration, sex, and renal and nutritional status in a group of older adults to assess the utility of single measure of clinical estimates of hydration status.

METHODS

Older adults were randomly recruited between 2005 and 2010 from patients admitted to a university hospital Acute Care for the Elderly service or seen in the geriatric primary care outpatient department. Eighty-two volunteers provided informed consent, 19 participants were excluded because they were current smokers; had an amputation; had implanted cardiac devices, metal pins, plates, or joint prostheses; or withdrew before completing the study protocol. Sixty-three participants (36 outpatients, 27 inpatients) were included in the final data analysis. The Vanderbilt

institutional review committee approved this study, and all participants provided informed consent.

All studies were completed at patients' bedsides within 1 to 3 days of admission or in the Senior Care Outpatient Center at the time of routine office visits. The hospital clinical laboratory measured U Osm. For four participants, urine specific gravity (U Sg) was used to estimate U Osm. None of the four participants had received contrast media or had high urinary glucose concentrations. The APACHE II score was calculated for each participant and used to estimate the severity of illness in inpatients and outpatients.[6] TBW and ECW were measured using BIA (Real Time Analyzer; RJL Systems, Clinton, MI), as previously described.[2]

Continuous variables were represented as medians with interquartile ranges. Categorical variables were summarized using percentages. The association between U Osm and the other clinical factors were assessed using Spearman rho correlation coefficients. Linear models using least squares were applied to test whether there was any association between TBW measured using BIA and U Osm, with adjustment for age, sex, and disease status. All statistical analyses were performed using R version 2.13.1 (www.r-project.org). All tests were two tailed.

RESULTS

The mean age of participants was 78.5 (range 66–95), and body mass index (BMI; kg/m^2) was 27.7 (range 12–47). Participants had multiple comorbidities and were classified according to major presenting diagnosis, including hypertension (22), diabetes mellitus (9), urinary tract infection (8) chronic obstructive pulmonary disease or pneumonia (6), Alzheimer's disease or psychosis (5), congestive heart failure (3), trauma with acute fracture (3), stroke or syncope (2), sepsis or cellulitis (2), chest pain (1), colon carcinoma (1), and acute pancreatitis (1). Detailed information on inpatient and outpatient groups is included in Figure 1A, with a plot of TBW versus U Osm in Figure 1B.

There was no relationship between TBW and the single measure U Osm. There was no relationship between phase angle (BIA measurement) or predicted TBW and U Osm, age, and administration of diuretics or intravenous fluids. Predicted TBW tended to be higher in men.

CONCLUSION

BIA-derived markers of hydration and U Osm were not related to disease category or severity, diuretic or intravenous administration, BMI, age, sex, or renal function in hospitalized or outpatient older adults. Others have found that single measures of U Osm do not correlate with acute dehydration states.[7] Changes in U Osm and U Sg are variably responsive to incremental changes in hypertonic dehydration in young athletes and may lag behind plasma osmolality in acute dehydrational states.[8] Water consumption can change in U Osm in young volunteers, but TBW and BIA are unchanged.[9] Despite their clinical importance, there is little valid information available regarding signs of dehydration in aging (Hooper L, personal communication). For clinical use, single measures of U Osm and BIA must be interpreted in relation to clinical findings.

A Study Participants

Characteristics	Inpatients (N=27)	Outpatients (N=36)
Gender		
Male	37%(10/27)	36%(13/36)
Female	63%(17/27)	64%(23/36)
Race		
Black	26%(7/27)	31%(11/36)
White	74%(20/27)	69%(25/36)
Age (years)	79(73–85)	78(72–82)
BMI (kg/m2)	26.6(25.1–30.9)	26.9(23.5–31.1)
Albumin (g/dL)	3.9(3.7–4.0)	4.1(3.9–4.2)
Creatinine (mg/dL)	0.9(0.7–1.4)	1.0(0.8–1.2)
# Medications	11(5–25)	11(3–24)
APACHE score	11(6–13)	10(6–11)

a(b–c) represents median(interquartile range)

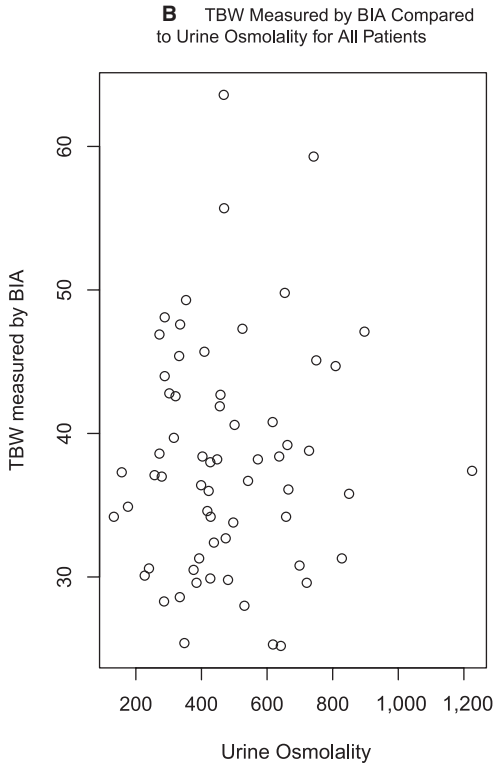

Figure 1. (A) Study participants. (B) TBW measured by BIA compared to urine osmolality for all patients.

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CLOSE RELATIONSHIPS AND RISK OF FRAILTY: THE HERTFORDSHIRE COHORT STUDY

To the Editor: Frailty is a syndrome in older people characterized by vulnerability to stressors due to impairments in multiple systems and decline in the ability to maintain homeostasis.[1,2] There is no accepted model or definition of frailty,[1] but it is generally agreed that its risk factors may be not just biological and genetic but also psychosocial.[3] One potential risk factor is quality of social relationships. Lack of social support and greater exposure to negative social interactions have been linked prospectively with poorer health and disability.[4–7] Whether social support and negative interactions were associated with risk of frailty was investigated.

METHODS

These analyses were based on 482 people from the Hertfordshire Cohort Study. At baseline (mean age 64.8 ± 2.74), they completed the Close Persons Questionnaire, which asks about negative aspects of close relationships, confiding and emotional support, and practical support in the last year.[8] Depression was assessed using the depression subscale of the Hospital Anxiety and Depression Scale and physical function using the physical function subscale of the Medical Outcome Study 36-item General Health Survey (SF-36). Body mass index (BMI) and grip strength were measured, and participants reported on their walking speed. At follow-up (mean 4.4 ± 0.9 years later), participants were assessed for frailty according to the Fried criteria.[2] Frailty was defined as the presence of three or more of unintentional weight loss (>10 pounds in the past year), weakness (maximum grip strength of $\leq$30 kg for men and $\leq$20 kg for women), self-reported exhaustion (participant felt everything they did was an effort on $\geq$3 days in the past week), slow walking speed (3-m walk time in the slowest fifth of the sex-specific distribution), and low physical activity (SF-36 physical functioning score in the bottom fifth of the sex-specific distribution).

The Bedfordshire & Hertfordshire Local Research Ethics Committee and West Hertfordshire Local Research Ethics Committee approved the study.

RESULTS

Eleven men (4.5%) and 24 women (10.1%) were frail at follow-up. Table 1 shows odds ratios (ORs) and 95% confidence intervals (CIs) for frailty according to thirds of the distribution of scores for negative aspects of close relationships, confiding and emotional support, and practical support at baseline.

In men, there were no differences in risk of frailty according to levels of negative interactions in close relationships or social support at baseline. In women, risk of frailty increased with level of negative interactions reported at baseline (*P*-value for interaction by sex = .04). Compared with women who were in the bottom third of the distribution for negative interactions, ORs for those in the middle