ELSEVIER

Surgery for Obesity and Related Diseases 8 (2012) 616–624

SURGERY FOR OBESITY AND RELATED DISEASES

Integrated health article

Older bariatric surgery candidates: is there greater psychological risk than for young and midlife candidates?

Leslie J. Heinberg, Ph.D.[a,b,*], Kathleen Ashton, Ph.D.[a,b], Amy Windover, Ph.D.[a,b], Julie Merrell, Ph.D.[a]

[a]*Bariatric and Metabolic Institute, Cleveland Clinic, Cleveland, Ohio*

[b]*Cleveland Clinic Lerner College of Medicine of Case Western Reserve University, Cleveland, Ohio*

Received August 4, 2011; accepted November 7, 2011

Abstract

Background: Although severe obesity is dramatically increasing in older adults, many bariatric programs use age cutoffs due to concerns about greater perioperative morbidity and mortality risks. More recently, surgical outcomes have been reported in older adults. However, a paucity of data is available on the psychological risks of older bariatric candidates. Our objective is to examine psychiatric risk factors and weight loss outcomes in older (≥65 yr) versus midlife (40–55 yr) versus young adult (18–29 yr) patients.

Methods: Older, midlife, and young adults (n = 608) who underwent weight loss surgery (74.6% women, 75.6% white, mean body mass index 48.07 ± 9.61 kg/m^2) at the Cleveland Clinic Bariatric and Metabolic Institute completed a psychiatric diagnostic interview, and the Minnesota Multiphasic Personality Inventory-2-Restructured Form, Binge Eating Scale, and Cleveland Clinic Behavioral Rating Scale before surgery. The data gathered from follow-up visits and weight loss outcomes at 1, 3, 6, 9, 12, and 18 months after surgery were measured.

Results: Young adults had a greater reduction in excess body mass index than those at midlife in the first 6 months but no age differences were noted in the following year. Older patients were less likely to have a suicide history but the groups were equivalent on other psychiatric variables and self-report measures. Psychologist evaluators rated older adults less favorably on the capacity to consent and realistic nature of expectations.

Conclusion: Although medical risks may cause concern, older adults do not demonstrate any increased psychological risk factors compared with midlife or young adult surgical candidates and evidenced equivalent weight loss. However, concerns with lower ratings on consent and expectations warrant additional research. (Surg Obes Relat Dis 2012;8:616–624.)

Keywords: Bariatric surgery; Psychology; Elderly; Weight loss; Psychosocial

The incidence of severe obesity has continued to rise in an increasingly aging population with approximately 25% of those older than age 60 years having a body mass index (BMI) in the obese range [1]. However, weight loss surgery in older patients has been underused, with many bariatric programs enforcing age cutoffs due to concerns about greater perioperative morbidity and mortality risks [2,3]. In 2006, the Centers for Medicare and Medicaid Services agreed to provide coverage for weight loss surgery for its Medicare beneficiaries who have a BMI ≥35 kg/m^2, ≥1 obesity-related co-morbidity, and have been previously unsuccessful with medical treatment for obesity [4]. This coverage allowed for bariatric surgery to be presented as an option to morbidly obese older individuals. Since then, a number of

*Correspondence: Leslie J. Heinberg, Ph.D., Bariatric and Metabolic Institute, Cleveland Clinic, 9500 Euclid Avenue, M61, Cleveland, OH 44195.

E-mail: heinbel@ccf.org

1550-7289/12/$ – see front matter
doi:10.1016/j.soard.2011.11.005

researchers have examined complications and outcomes among these older patients. In contrast to early work that focused on both open and laparoscopic procedures [1,5], more recent studies examining samples undergoing laparoscopic approaches have found positive outcomes [6,7]. Furthermore, comparable mortality, complications, and weight loss outcomes have been demonstrated compared with younger bariatric patients [8,9].

Although medical co-morbidities increase with age, many psychiatric risk factors decrease. The prevalence of major psychiatric illnesses [10], mood and anxiety disorders [11], and substance abuse [12] are lower when comparing older and younger cohorts. Furthermore, binge eating disorder is significantly less prevalent in persons >65 versus <65 years [11]. Studies have also demonstrated that younger patients are less adherent with postoperative follow-up after bariatric surgery [13]. In contrast, concerns with possible cognitive decline and fewer social supports among older bariatric candidates have been noted [14]. Of particular concern is the noted interaction between age and BMI on intensifying white matter dysfunction and associated cognitive deficits [15,16], suggesting greater vulnerability in older bariatric patients.

Despite greater access to bariatric surgery, a paucity of data is available on the psychological risks of older adult bariatric candidates. The present study was conducted to examine age differences in the demographic variables, psychiatric history, psychological testing results, postoperative weight loss, and compliance with postoperative visits among 3 age groups: young adult patients (18–29 yr), midlife patients (40–55 yr), and older patients (≥65 yr). It was hypothesized that older patients would have fewer psychosocial co-morbidities and fewer binge eating symptoms and emotional distress on psychological measures compared with the young and midlife adults. We also hypothesized that older patients would demonstrate greater postoperative adherence with appointments than younger cohorts. However, the psychologists' ratings of capacity to consent, realistic nature of expectations, and social support were hypothesized to be lower in older patients compared with the other cohorts owing to potential worsening cognitive deficits and loss of supports related to age. Finally, consistent with previous studies, we did not hypothesize any age differences in the percentage of excess BMI loss.

Methods

Participants

Participants were included if they had undergone weight loss surgery at the Cleveland Clinic Bariatric and Metabolic Institute at the analysis and had ≥2 scheduled follow-up visits at 1, 3, 6, 9, 12, and 18 months postoperatively. Of the larger sample of 948 participants, 608 were selected that fit the following age categories: young adult (18–29 yr; n = 82), midlife (40–55 yr; n = 460), and older adult (≥65 yr; n = 70). Most patients were women (74.6%) and white (75.6%; 20.9% black). The mean education level was 14.21 ± 2.47 years. Consistent with a bariatric population, the mean BMI was in the clinically severe obese range (mean 48.07 ± 9.61 kg/m^2).

Most (n = 409; 67.3%) underwent laparoscopic Roux-en-Y gastric bypass; 106 patients (17.4%) underwent laparoscopic adjustable gastric banding, 74 (12.5%) underwent laparoscopic sleeve gastrectomy, and 19 (3.2%) underwent a revision procedure. The Cleveland Clinic's institutional review board approved the present study.

Assessments

At the initial psychological evaluation, all patients completed the Minnesota Multiphasic Personality Inventory-2, restructured form (MMPI-2-RF) [17]. The MMPI-2-RF is a 338-item objective and multifaceted measure of personality and psychopathology. It includes reliable and empirically validated measures of emotional, thought, behavioral, somatic, and interpersonal dysfunction. The 9 restructured clinical scales were included in the analyses. The restructured clinical scales have good internal consistency (mean Cronbach's α = .74) and convergent and discriminant validity within a bariatric surgery sample [18]. Patients with invalid profiles were excluded from the analyses. Profile invalidity was determined for those with unscorable, cannot say responses ≥18, a *T* score of ≥80 on variable response inconsistency, a *T* score of ≥80 on true response inconsistency, and/or a *T* score of ≥100 on infrequent psychopathology responses.

Patients also completed the Binge Eating Scale (BES) [19] at the initial psychological evaluation. The BES consists of 16 items that describe the affective, cognitive, and behavioral aspects of binge eating. The measure has been found to have construct validity in its ability to distinguish between minimal, moderate, and severe binge eating problems. Clinical cutoffs of binge eating severity have been established for the BES [20], and internal consistency has been reported in bariatric populations (Cronbach's α = .90) [21].

Finally, the Cleveland Clinic Behavioral Rating System (CCBRS) [22] was completed by the evaluating psychologist immediately after the interview. Each of 9 domains was assessed on a Likert-rating scale from 5 (excellent) to 1 (poor). Thus, lower scores reflect less favorable ratings. The 9 domains of interest were (1) consent (capacity to consent, possible cognitive impairment, understanding of risks, benefits, alternative treatment); (2) expectations (realistic nature of surgery, recovery, early transition, weight loss goals, effect on relationships, quality of life, long-term outcome, and so forth); (3) social support (support by spouse or significant other, children, family members, friends, employer, coworkers, in addition to previous conversations

with bariatric patients, attendance at support groups); (4) mental health (psychiatric diagnosis, severity, and duration of diagnosis; effect of illness on cognitive capacity, present stability/instability of illness, current treatment, adherence to treatment recommendations, psychosocial stress that might affect illness and patient insight); (5) substance use/abuse/dependence (use, abuse, and dependence of alcohol, prescription, and illicit drugs, current and past tobacco use, including history and present use and if the history considers a period of sobriety and relapse risk); (6) eating behaviors (binge eating behaviors, night eating behaviors, compensatory behaviors, history of eating disordered behaviors, and problematic outcomes from past dieting attempts; also considers behaviors [e.g., "grazing," high-calorie beverage consumption] that might affect outcome; (7) adherence (adherence during previous dieting attempts, adherence with past psychological/psychiatric interventions, adherence with medical recommendations, likely adherence with tobacco prohibition, and with program protocol); (8) coping/stressors (assessment of coping resources in the context of situational stressors); and (9) overall rating by the evaluator. The CCBRS has excellent internal consistency (Cronbach's $\alpha = .88$) and good consistency across providers ($r = .82$) [20].

At the initial entry into the bariatric program, semistructured psychiatric interviews conducted by licensed clinical psychologists, or postdoctoral fellows under their supervision, specializing in bariatric psychology were completed on all patients (for more information on the procedures, see Heinberg et al., [22]). Trained research assistants abstracted data on the following variables: current psychiatric medication use, history of inpatient psychiatric hospitalization, suicide history, smoking status, and substance abuse history.

Clinical indexes and demographics

During their preoperative evaluation, the patients' height, weight, BMI, gender, ethnicity, years of education, and age were recorded. The type of weight loss surgery was determined from the operative note. The weight and BMI were measured at each subsequent follow-up visit at 1, 3, 6, 9, 12, and 18 months. Finally, attendance at the follow-up visits with the surgeon, dietitian, and psychologist were determined from the electronic medical record.

Statistical analysis

Group differences among the young adult, midlife, and older patients were evaluated using chi-square analyses for categorical variables (i.e., gender, ethnicity, current psychiatric medication use, history of inpatient psychiatric hospitalization, suicide history, smoking status, substance abuse history, and attendance at follow-up visits). Rather than examining age as a continuous variable and potentially failing to find bimodal distributions (e.g., less appointment adherence in both the youngest and oldest cohorts), a series of analyses of covariance examining the group differences in weight loss at 1, 3, 6, 9, 12, and 18 months after surgery were conducted comparing the age categories and controlling for the possible covariates of gender, race/ethnicity, education, and surgery type. Similar analyses of covariance were conducted for restructured clinical scales of the MMPI-2-RF, BES, and the domains of the CCBRS. When significant differences were found, least significant difference post hoc tests were conducted.

Results

The groups differed by surgery type [Chi-square (4, 608) = 26.71, $P < .001$]. Midlife patients were more likely to have undergone Roux-en-Y gastric bypass (70.5% versus 62% of young adult patients versus 51% of older patients), laparoscopic adjustable gastric banding was more common in older patients (35.7% versus 20% of young adult and 14.2% of midlife patients), and laparoscopic sleeve gastrectomy was more common in young adult patients (17.5% versus 14.2% of midlife patients and 11.4% of older patients). Significant group differences were also found for gender [Chi-square (2, 608) = 10.79, $P < .01$]. The young adult sample was 86.67% female versus 74.32% of the midlife patients and 62.69% of the older patients. No differences were noted for race/ethnicity or years of education ($P > .10$). Because weight loss outcomes can differ by surgery type and gender, subsequent analyses controlled for both these variables. Baseline BMI differences were also found among the groups [F (2, 606) = 6.10; $P < .01$], with young adult patients (mean 51.15 ± 11.27 kg/m^2) significantly heavier than both midlife (mean 47.90 ± 9.63 kg/m^2) and older adults (mean 45.58 ± 5.71 kg/m^2). As a result, the percentage of excess BMI units (%EBMI) was used as an outcome variable rather than BMI change.

No age group differences were found for current psychiatric medication use, a history of substance abuse/dependence or inpatient psychiatric hospitalization ($P > .10$; Fig. 1). Significant differences were noted for a suicide history [Chi-square (2, 608) = 7.57, $P < .03$]. Only 1.49% of older adults endorsed a previous suicide attempt compared with 9.07% of midlife adults and 12.16% of young adults. Group differences were also noted for a smoking history [Chi-square (2, 608) = 10.33, $P < .03$]. Younger patients were less likely to have had a smoking history (27.39%) compared with midlife (42.09%) and older (49.25%) adults. For both surgical follow-up visits [Chi-square (2, 608) = 10.13, $P < .01$] and nutrition follow-up visits [Chi-square (2, 608) = 4.79, $P < .05$] young adults were less likely to adhere to appointments than their older peers (Fig. 1). No differences were found with adherence to psychology follow-up visits.

A significant difference for age was found for %EBMI at 1 month of follow-up after controlling for gender and surgery type [F (4, 600) = 5.13; $P < .005$], with midlife

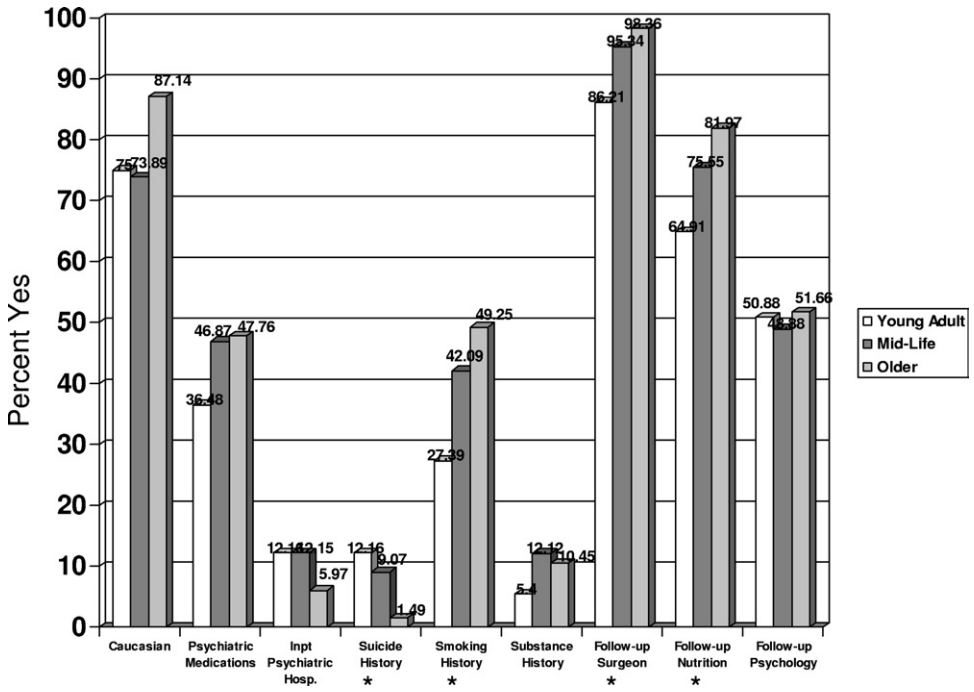

Fig. 1. Age Group Differences for Demographics, Clinical Variables and Adherence with Follow-Up Appointments (* connotes $P < .05$).

patients reducing their %EBMI significantly more than younger patients (Table 1). At 3 months, the age differences were no longer significant; however, at 6 months of follow-up, a significant main effect was found with midlife patients reducing their %EBMI significantly more than in younger patients [F (4, 547) = 3.69; $P < .03$]. Again, older adults did not differ from the other groups. After 6 months of follow-up, the age differences were no longer significant.

Only 2 MMPI-2-RF profiles were invalid, and no differences were found among groups on MMPI-2-RF validity. No significant differences were found on any of MMPI-2-RF restructured clinical scales or for the BES (all $P > .10$; Table 2). On the CCBRS, an age effect was found on consent ($P < .005$; Table 3). Younger patients were rated greater on consent than both midlife and older patients and midlife patients were significantly greater than older adults (all post hoc $P < .05$). An age effect was also found for expectations ($P < .05$), with younger patients rated significantly greater ($P < .05$) than the other 2 age groups. Trends were found for social support ($P < .10$) and mental health ($P < .09$). Younger patients were rated as greater on social support than midlife patients, and older patients were rated as greater on mental health than midlife candidates (all $P < .05$). Finally, a main age effect was found on the overall CCBRS rating ($P < .005$), with younger patients receiving greater ratings than midlife candidates (Table 3).

Discussion

These findings indicate that older adults show equivalent weight loss and do not demonstrate any increased psychological risk factors compared with young adult and midlife

Table 1
Percentage of excess body mass index loss across age groups controlling for gender and surgery type

Follow-up point (mo)	%EBMIL			F	P value
	Young adult (n = 80)	Midlife (n = 458)	Older (n = 70)		
1	16.29 ± 7.85*	21.36 ± 11.99*	20.21 ± 10.63	5.13	<.005
3	32.73 ± 18.20	37.39 ± 17.59	34.69 ± 15.63	1.11	NS
6	44.01 ± 21.31*	53.30 ± 24.98*	45.85 ± 24.22	3.69	<.03
9	51.96 ± 22.44	60.08 ± 25.33	50.92 ± 26.50	2.22	NS
12	53.35 ± 26.26	63.00 ± 25.21	54.08 ± 29.46	2.09	NS
18	57.61 ± 25.72	65.62 ± 25.30	58.24 ± 34.23	.53	NS

%EBMIL = percentage of excess body mass index loss; NS = not significant.
Data presented as mean ± SD.
* Significantly different at $P < .05$.

Table 2
Minnesota Multiphasic Personality Inventory 2 Revised Form clinical scales and Binge Eating Scale across age groups controlling for gender and surgery type

Variable	Young adult (n = 80)	Midlife (n = 458)	Older (n = 70)	*F*
MMPI-2-RF				
Demoralization	49.55 ± 8.63	50.55 ± 9.42	49.52 ± 8.91	.20
Somatic complaints	53.50 ± 11.48	57.36 ± 11.63	57.27 ± 7.19	1.47
Low positive emotions	47.91 ± 8.51	50.75 ± 10.81	53.15 ± 9.67	1.19
Cynicism	47.36 ± 10.74	48.73 ± 10.00	48.19 ± 8.13	.25
Antisocial behavior	44.50 ± 6.35	45.60 ± 8.02	44.88 ± 7.13	.48
Ideas of persecution	48.18 ± 7.14	51.18 ± 9.50	49.15 ± 8.21	1.37
Dysfunctional negative emotions	46.74 ± 11.07	45.89 ± 9.31	43.58 ± 8.55	0.62
Aberrant experiences	45.41 ± 5.51	46.61 ± 8.34	44.85 ± 5.75	.81
Hypomanic behavior	42.36 ± 6.24	43.38 ± 7.53	43.27 ± 7.99	.18
Binge eating scale	17.36 ± 9.47	16.64 ± 9.66	17.06 ± 8.98	.24

MMPI-2-RF = Minnesota Multiphasic Personality Inventory 2 Revised Form.
Data presented as mean ± SD.
P values not significant.

surgical candidates. Young adult patients demonstrated greater %EBMI loss compared with midlife patients in the first 6 months; however, this effect was no longer significant in the year after this point, and equivalent weight loss benefits were noted at all points for older patients consistent with other studies [8,9]. Older patients were less likely to have a history of suicide and were equivalent on other psychiatric historical variables, the MMPI-2-RF, and the BES. Although we had hypothesized significantly less eating pathology, psychopathology, and distress given the tendency for these factors to attenuate with age [11], the results have demonstrated relative equivalency across the age spectrum. Only the psychologists' ratings of mental health demonstrated a trend toward more positive assessments for older patients versus those at midlife. Measures, such as the BES and the MMPI-2-RF, are not diagnostic and future work might find age effects when using structured diagnostic interviews rather than symptom instruments or those assessing stable personality factors. Finally, although the substance abuse rates did not vary among the groups, young adult patients were less likely to have a smoking history; however, this might be a generational effect in smoking behavior [12].

Unlike other psychometric instruments, age differences were noted on the CCBRS. The psychologists' ratings of the young patients' consent was significantly greater than that of midlife patients, who, in turn, were rated more highly than older adults. Given that this domain assesses the capacity to consent, possible cognitive impairment, and an understanding of the risks and benefits, this might be reflective of the raters' perceptions of the possible cognitive difficulties related to age. Cognitive impairment has been shown to increase with both advanced age [23] and obesity [24], with a likely interaction between the two [15,16]. Executive function involving reasoning, processing speed, complex problem solving, attention, and memory show the greatest possible deterioration with age. Aspects such as memory and attention can impede the ability to consent and have a realistic understanding of the surgery [14–16]. Similarly, younger patients were given higher ratings on their

Table 3
CCBRS results across age groups controlling for gender and surgery type

CCBRS	Young adult (n = 80)	Midlife (n = 458)	Older (n = 70)	*F*	*P* value
Consent	3.93 ± .53*†	3.68 ± .75†‡	3.41 ± .72*‡	5.87	<.005
Expectations	3.68 ± .48)*†	3.33 ± 0.65*	3.32 ± 0.56†	3.22	<.05
Social support	3.82 ± .39*	3.49 ± .70*	3.58 ± 0.66	2.67	.09
Mental health	3.55 ± .80	3.38 ± .80*	3.67_a ± .81	2.54	.08
Substance/alcohol	4.09 ± 0.61	3.85 ± .82	4.11 ± .75	2.05	NS
Eating behaviors	3.23 ± 0.69	2.98 ± .58	3.12 ± 0.63	1.90	NS
Adherence	3.55 ± .51	3.34 ± .71	3.41 ± .57	.83	NS
Coping/stressors	3.41 ± 0.67	3.20 ± 0.66	3.44 ± .58	2.23	NS
Overall	3.82 ± .59*	3.34 ± 0.66*	3.44 ± .58	4.91	<.005

CCBRS = Cleveland Clinic Behavioral Rating System.
* Items significantly different from each other at $P < .05$.
† Items significantly different from each other at $P < .05$.
‡ Items significantly different from each other at $P < .05$.

expectations than the other 2 age groups. This domain measures the patients' understanding of the realistic nature of surgery, recovery, early transition, weight loss goals, effect on relationships, quality of life, long-term outcome, and so forth. This was somewhat surprising given that previous studies have noted a relationship between unrealistic weight loss goals and patient age [25]. However, these ratings might more strongly relate to an understanding of the procedure and of the risks and benefits.

Younger patients also showed a trend toward greater social support ratings than midlife patients but not older patients, as hypothesized. Older adults often experience a shrinking social networks from retirement, death, adult children leaving the area, and so forth. However, these limitations could also affect those at midlife. Younger patients might benefit from the assistance of parents and siblings, in addition to spouses and friends. As patients age, however, social supports could be even more important as a method of helping them with the intricacies of postoperative nutrition plans or providing transportation to and from appointments. Thus, the assessment of support is an important part of the evaluation of the midlife and older patient, with the knowledge that the quality of support is likely more important than the quantity [26].

As previously noted, older patients showed a trend toward better mental health ratings by the evaluators compared with the midlife patients. This might be reflective of age differences in psychopathology but could also reflect cohort differences in the willingness to disclose psychological difficulties [27]. Younger patients were given greater overall ratings than midlife patients, but the older patients did not differ from either group. Except for the mental health ratings being highest in the oldest subsample, all other domains on the CCBRS were highest in the young adult group. Thus, the summary rating favoring this age group was not surprising.

Attendance at follow-up visits is associated with greater adherence [13]. The midlife and older adults had greater adherence with these visits, which might be a positive prognostic factor for older bariatric surgery candidates. Older patients might have more insight/experience into the risks of nonadherence and the importance of ongoing medical care/follow-up. Furthermore, it might be easier for older individuals who might be less burdened by the demands of work and family to attend these visits. Attendance at psychological follow-up visits was less frequent than the surgeon or dietitian visits across all age groups. Patients might not believe it was a necessary part of their after care or might be experiencing less psychological distress as their quality of life improves.

The present study had a number of limitations. Because the CCBRS is based on clinician ratings it is subject to rater bias. More objective measures of social support, cognitive functioning/capacity might have given different results. Other instruments are self-report and might reflect differences in guardedness. All patients completed these measures and reported historical variables in the context of a preoperative evaluation. Congruence between clinical evaluations and structured research-based assessments has been previously shown to be quite low [28]. The degree of underreporting and whether there are age differences in such tendencies is unknown.

Future research should examine age-related differences in weight loss outcomes in the years after bariatric surgery. Other important outcomes, such as quality of life, eating behaviors, and adherence with postoperative recommendations, should be examined. Differential adherence with postoperative recommendations (e.g., exercise, compliance with supplements, dietary intake) among age groups should also be assessed. Additional work should examine other factors that could affect outcomes in older adults, including cognitive issues, amount of social support, and mobility. Older patients were more likely to be men and had a lower baseline BMI. Future work should examine referral patterns, motivation for surgery, and other factors that might explain these demographic differences. Older patients were also more likely to have banding procedures. Research should examine whether this resulted from differences in Medicare coverage (i.e., only Roux-en-Y gastric bypass and laparoscopic adjustable gastric banding are reimbursed) or if other factors explain these differences.

Conclusion

Although medical risk factors could cause concern, these findings indicate that older adults do not demonstrate any increased psychological risk factors over young adult or midlife surgical candidates. Equivalent weight loss benefits were also found. Older patients were less likely to have a past suicide attempt and were more likely to attend follow-up appointments with their surgeon and dietitian. However, psychologists rated their consent and expectations less favorably than younger cohorts, suggesting the import of cognitive factors. With careful preoperative assessment of the medical risk factors and of psychological and cognitive functioning, older patients should not be discouraged from undergoing bariatric surgery and experiencing its many benefits.

Disclosures

The authors have no commercial associations that might be a conflict of interest in relation to this article.

References

[1] Flegal KM, Carroll MD, Ogden CL, Curtin LR. Prevalence and trends in obesity among US adults, 1999-2008. National Center for Health Statistics, Center for Disease Control and Prevention. JAMA 2010; 303:235–41.

[2] Livingston EH, Langert J. The impact of age and Medicare status on bariatric surgical outcomes. Arch Surg 2006;141:1115–20.
[3] Flum DR, Salem L, Elrod JB, Dellinger EP, Cheadle A, Chan L. Early mortality among Medicare beneficiaries undergoing bariatric surgical procedures. JAMA 2005;294:1903–8.
[4] National Coverage Determination (NCD) for Bariatric Surgery for Treatment of Morbid Obesity (100.1). Available from: http://www.cms.gov/medicare-coverage-database. Accessed July 15, 2011.
[5] Varela JE, Wilson SE, Nguyen NT. Outcomes of bariatric surgery in the elderly. Oral Presentation. 17th Annual Conference of the Southern California Chapter of the American College of Surgeons, Santa Barbara, CA, January 20–22, 2006.
[6] O'Keefe KL, Kemmeter PR, Kemmeter KD. Bariatric surgery outcomes in patients aged 65 years and older at an American Society for Metabolic and Bariatric Surgery center of excellence. Obes Surg 2010;10:1199–205.
[7] Wittgrove AC, Martinez T. Laparoscopic gastric bypass in patients 60 years and older: early postoperative morbidity and resolution of comorbidities. Obes Surg 2009;19:1472–6.
[8] Fatima J, Houghton SG, Iqbal CW, et al. Bariatric surgery at the extremes of age. J Gastrointest Surg 2006;10:1392–6.
[9] Willkomm CM, Fisher TL, Barnes GS, Kennedy CI, Kuhn JA. Surgical weight loss >65 years old: is it worth the risk? Surg Obes Relat Dis 2010;6:491–7.
[10] National Survey on Drug Use and Health. Prevalence of Serious Mental Illness Among U.S. Adults by Age, Sex, and Race in 2008. Available from: http://www.nimh.nih.gov/statistics/SMI_AASR.shtml. Accessed July 20, 2011.
[11] Klapow J, Kroenke K, Horton T, Schmidt S, Spitzer R, Williams JBW. Psychological disorders and distress in older primary care patients: a comparison of older and younger samples. Psychosom Med 2002;64:635–43.
[12] Office of Applied Studies, 2006 National Survey of Drug Use and Health: National Results. U.S. Department of Health and Human Services. Available from: http://oas.samhsa.gov/NSDUH/2k6NSDUH/2k6results.cfm#Ch8/. Accessed July 20 2011.
[13] Wheeler E, Prettyman A, Lenhard MJ, Tran K. Adherence to outpatient program postoperative appointments after bariatric surgery. Surg Obes Relat Dis 2008;4:515–20.
[14] Henrickson HC, Ashton KR, Windover AK, Heinberg LJ. Psychological considerations for bariatric surgery among older adults. Obes Surg 2009;19:211–16.
[15] Stanek KM, Grieve SM, Brickman AM, et al. Obesity is associated with reduced white matter integrity in otherwise healthy adults. Obesity 2011;19:500–4.
[16] Gunstad J, Lhotsky A, Wendell CR, Ferrucci L, Zonderman AB. Longitudinal examination of obesity and cognitive function: results from the Baltimore Longitudinal Study of Aging. Neuroepidemiology 2010;34:230–1.
[17] Ben-Porath YS, Tellegen A. Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF). Minneapolis, MN: University of Minnesota Press; 2008.
[18] Wygant DB, Boutacoff LI, Arbisi PA, Ben-Porath YS, Kelly PH, Rupp WM. Examination of the MMPI-2 restructured clinical (RC) scales in a sample of bariatric surgery candidates. J Clin Psychol Med Settings 2007;14:197–205.
[19] Gormally J, Black S, Daston S, Rardin D. The assessment of binge eating severity among obese persons. Addict Behav 1982;7:47–55.
[20] Marcus MD, Wing RR, Hopkins J. Obese binge eaters: affect, cognition and response to behavioral weight control. J Consult Clin Psychol 1988;3:433–9.
[21] Ashton K, Drerup M, Windover A, Heinberg LJ. Efficacy of a four-session cognitive behavioral group intervention for binge eating among bariatric surgery candidates. Surg Obes Relat Dis 2009;5:276–82.
[22] Heinberg LJ, Ashton K, Windover A. Moving beyond dichotomous psychological evaluation: the Cleveland Clinic behavioral rating system for weight loss surgery. Surg Obes Relat Dis 2010;6:185–90.
[23] Park HL, O'Connell JE, Thomson RG. A systematic review of cognitive decline in the general elderly population. Int J Geriatr Psychiatry 2003;18:1121–34.
[24] Gunstad J, Strain G, Devlin MJ, et al. Improved memory function 12 weeks after bariatric surgery. Surg Obes Relat Dis 2012;7:465–72.
[25] Heinberg LJ, Keating K, Simonelli L. Discrepancy between ideal and realistic goal weights across three bariatric procedures: who is going to be disappointed? Obes Surg 2010;20:148–53.
[26] Antonucci TC, Fuhrer R, Jackson JS. Social support and reciprocity: a cross-ethnic and cross-national perspective. J Soc Pers Relatsh 1990;7:519–30.
[27] Segal DL, Coolidge FL, Mincic MS, O'Riley A. Beliefs about mental illness and willingness to seek help: a cross-sectional study. Aging Ment Health 2005;9:363–7.
[28] Mitchell JE, Steffen KJ, de Zwaan M, Ertelt TW, Marino JM, Mueller A. Congruence between clinical and research-based psychiatric assessment in bariatric surgical candidates. Surg Obes Relat Dis 2010;6:628–34.

Editorial comment

Comment on: Older bariatric surgery candidates: is there greater psychological risk than for young and mid-life candidates?

Given the growing evidence in the surgical data on the safety and efficacy of bariatric surgery for older adults (age ≥65 years) and the Medicare's 2006 decision to cover weight loss surgery in this population, the frequency with which older patients present for a preoperative evaluation is likely to increase [1–8]. Assessing and treating this distinct subgroup of patients could involve some tailoring of the standard preoperative workup and treatment planning process to assist older patients in maximizing their chances of long-term success. Until recently, little guidance was available in the published data for behavioral health providers that specifically addressed clinical work with older bariatric surgery patients. Henrickson et al. [9] at the Cleveland Clinic presented excellent suggestions on this topic in a recent report focusing on a patient-centered approach that includes psychosocial and cognitive factors to be considered during the evaluation of older bariatric patients.

Their present report empirically examines the psychological risk factors and weight loss outcomes for bariatric surgery patients by age group. Comparable to surgical studies finding