IJGC

INDIAN JOURNAL OF GERIATRIC CARE

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HIGHLIGHTS

GERIATRIC SOCIETY INDIA
CARING THE ELDERLY


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in older adults
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+MUSCLES
+BONES
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Strength PLUS
Vanilla flavour
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Editorial

Sajesh Asokan
Immediate Past President, Geriatric Society of India and Executive Editor IJGC

Contemporary Issues in Geriatric Care

The Indian Journal of Geriatric Care continues its commitment to presenting clinically relevant and academically sound contributions that address the diverse health needs of older adults. The October–December 2025 issue brings together original research, review articles, and case reports that reflect important aspects of geriatric practice in the Indian setting.

This issue features an original article evaluating the effects of a four-week structured yoga intervention on functional abilities among elderly women residing in an old age home. Functional decline remains a major determinant of quality of life in later years, and this study highlights the potential role of structured physical interventions in institutionalised elderly populations.

The review articles in this issue address common and clinically significant problems encountered in geriatric practice. The approach to unintentional weight loss in the elderly provides a systematic framework for evaluation and management of a frequently overlooked yet serious clinical presentation. Hyponatremia in older adults is reviewed as a modifiable geriatric syndrome, with particular emphasis on its association with falls, frailty, and functional decline. The review on spirituality in geriatric care offers insight into an often under-addressed dimension of holistic care, emphasising its relevance in supporting the overall well-being of older persons.

The case reports included in this issue serve as important learning tools for clinicians. A case of delirium in an elderly patient reinforces the importance of early recognition and prompt management of acute confusional states. The report on carbapenem-induced rash highlights the need for continued vigilance regarding adverse drug reactions, especially in hospitalised older adults who are vulnerable to complications related to polypharmacy.

Taken together, the contributions in this issue underscore key principles of geriatric medicine—maintenance of functional ability, careful clinical assessment, recognition of geriatric syndromes, and attention to psychosocial and safety aspects of care. We trust that this issue will be of practical value to clinicians and contribute to improved care of the elderly.

Effects of a Four-Week Structured Yoga Intervention on Functional Abilities Among Older Women Residing in an Old Age Home: A Pilot Study

Rajkumar Powdel[1]

Abstract

Institutionalized older women face significant functional decline, affecting their physical performance, cognitive function, and psychological well-being. This pilot study assessed the impact of a structured four-week yoga intervention on the functional abilities of elderly women in an old-age home.A single-group pre-test post-test design was employed with 46 female residents (mean age: 70.37±5.93 years) at the Apnaghar Old Age Home, Agartala, India. The progressive yoga intervention increased from 30 min (4 days/week) in week 1 to 45 min (7 days/week) in week 4. Outcome measures included Short Physical Performance Battery (SPPB), handgrip strength (Camry EH101 Dynamometer), cognitive function (Mini-Cog™), and psychological well-being (WHO-5 Well-being Index). Data were analyzed using the Wilcoxon signed-rank test at $p<0.05$. The mean age of the participants was 70.37±5.93 years. Post-intervention improvements were significant across all measures: SPPB scores increased from 7.80±0.654 to 8.52±1.150 ($p<0.001$); handgrip strength improved from 12.35±1.31 kg to 13.99±1.89 kg ($p<0.001$); Mini-Cog™ scores enhanced from 3.00±0.874 to 3.80±0.401 ($p<0.001$); and WHO-5 Well-being Index scores increased from 57.83±4.596 to 77.39±6.705 ($p<0.001$).The structured four-week yoga intervention significantly enhanced physical performance, grip strength, cognitive function, and psychological well-being in older women living in institutions. These findings suggest that yoga is a viable intervention for improving functional capacity and quality of life in this vulnerable population.

Keywords: *Older women, functional ability, old-age home, yoga intervention*

INTRODUCTION

The global demographic transition toward an aging population presents unprecedented challenges for healthcare systems and social welfare. By 2030, individuals aged 60 years and above are projected to constitute 16.67% of the total population globally, with India's elderly population expected to reach 13.1% by 2031.[1,2] This demographic shift has significantly impacted India's traditional joint family care system, with migration, urbanization, and socioeconomic changes leading to increased institutionalization of elderly individuals.[3,4]

Aging is typically associated with a decline in physical, cognitive, and psychological functions. Physical deterioration includes reduced mobility, balance, and strength, increasing fall risk and impairment in activities of daily living.[5,6] Cognitive functions such as memory, processing speed, and executive function show similar decline, affecting information retention, multitasking, and decision-making processes.[7,8] Psychologically, aging increases vulnerability to anxiety, depression, and social isolation, impacting emotional well-being and self-esteem.[9]

Institutionalized older women are particularly vulnerable to functional impairment due to restricted physical activity, social isolation, and psychosocial effects of family separation.[10,11] Post-menopausal hormonal changes further increase their susceptibility to osteoporosis, cardiovascular disease, depression, and anxiety.[12,13]

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Research indicates that exercise and mind-body interventions can effectively mitigate age-related functional decline.[14,15]

Yoga, an ancient Indian practice combining physical postures (asanas), breathing exercises (pranayama), and meditation, has demonstrated efficacy as a therapeutic intervention for improving physical and mental well-being across age groups.[16] Studies have shown yoga's benefits in older adults, including improved balance, flexibility, muscular strength, and cognitive function[17,18] Additionally, yoga interventions have been associated with enhanced psychological well-being, reduced stress, and improved quality of life in elderly populations.[19,20]

However, limited research exists on structured yoga interventions specifically targeting older Indian women in institutions. Most previous studies have focused on community-dwelling older adults or have not specifically addressed the unique needs of women residing in old-age homes.[21,22] Given the increasing elderly population and the rising number of institutional care facilities in India, there is a considerable need to develop and validate interventions that can objectively facilitate healthy aging and improve functional capacity among institutionalized older women.

This study aimed to assess the efficacy of a four-week structured yoga intervention on physical performance, grip strength, cognitive function, and psychological well-being among elderly women residing in an old-age home in Agartala, India.

MATERIALS AND METHODS

Study Design and Setting

This single-group pre-test-post-test intervention study was conducted at Apnaghar Old Age Home, Agartala, Tripura, India, from October 26, 2024, to November 26, 2024. The study protocol adhered to the Declaration of Helsinki guidelines and received approval from the Manipur University Institutional Ethics Committee, Canchipur, Imphal, Manipur.

Study Population and Sample Characteristics

The study population comprised female residents aged ≥ 60 years. The inclusion criteria were as follows: ability to walk and stand independently, willingness to participate in all assessments and yoga sessions, and cognitive capacity to provide informed consent. The exclusion criteria were bedridden status, requirement of walking aids, acute illness during assessment, and severe visual or hearing impairments that would interfere with testing. From 50 eligible residents, 46 participants were recruited and completed the study after excluding four individuals who were bedridden or required walking assistance. Ethical clearance was obtained from Institutional Ethics Committee, Manipur University vide Ref. No. MU/IHEC/2024/18.

Assessment Tools

Physical Performance Measure: The Short Physical Performance Battery (SPPB) was used to assess lower extremity function through three components: balance tests (side-by-side, semi-tandem, and tandem stands for 10 s), gait speed (timed 4-meter walk), and chair stand test (five sit-to-stand repetitions). Each component was scored 0-4 points, with total scores ranging 0-12.[23,24]

Hand Grip Strength Measurement Hand grip strength was measured using a calibrated Camry EH101 Handheld Dynamometer. The participants were seated with their elbows flexed at 90° and wrists in a neutral position. Three attempts were performed with the dominant hand, with 30-second rest intervals, and maximum values recorded in kilograms.[25]

Cognitive Assessment Cognitive function was evaluated using Mini-Cog™, comprising three-word recall and clock drawing tasks. Scoring included one point per correctly recalled word and two points for proper clock drawing, with total scores ranging 0-5 points.[26]

Psychological Evaluation Psychological well-being was assessed using the WHO-5 Well-Being Index, administered in the participants' preferred language. Five positive statements about emotional well-being over the previous two weeks were evaluated using a 6-point Likert scale (0="At no time" to 5="All of the time"). Total scores were multiplied by 4, yielding final scores between 0-100, with higher scores indicating better well-being.[27]

Yoga Intervention Protocol

The yoga intervention was based on established frameworks from the Morarji Desai National Institute of Yoga (MDNIY) geriatric protocol, the National Institute of Mental Health and Neurosciences (NIMHANS) models, and Sukshma Vyayama exercises. The intervention was progressively structured over four weeks.

- Week 1: 30 minutes, 4 days/week
- Week 2: 35 minutes, 5 days/week
- Week 3: 40 minutes, 6 days/week
- Week 4: 45 minutes, 7 days/week

Each session included an opening prayer and centering (2-3 minutes), Sukshma Vyayama joint movements (5-10 minutes), modified asanas for elderly participants (10-15 minutes), yogic kriyas (2-5 minutes), pranayama breathing exercises (5-10 minutes), and meditation with relaxation (5-7 minutes).

The sessions were led by the researcher and a certified yoga instructor trained in geriatric protocols. Verbal instructions and demonstrations were provided with appropriate modifications for individual physical capacities, and chairs were used for support when necessary.

Data Collection Procedure

Baseline measurements were conducted one week before the intervention. Physical function tests (SPPB and handgrip strength) were performed during morning sessions (8:00-10:00 AM), while cognitive and psychological assessments (Mini-Cog™ and WHO-5 Well-being Index) were conducted during afternoon sessions (2:00-4:00 PM) to minimize fatigue effects. Post-intervention assessments were completed within two days of intervention completion, using identical procedures.

Statistical Analysis

Statistical analyses were performed using SPSS version 24.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to determine the means and standard deviations for all outcome measures. Data normality was assessed using the Shapiro-Wilk test. Since the data violated parametric test assumptions, pre- and post-intervention comparisons were conducted using the Wilcoxon Signed Ranks Test. Statistical significance was set at $p<0.05$ with 95% confidence intervals.

RESULTS

Sociodemographic Profile

The sociodemographic characteristics of the participants are presented in ***Table 1.*** The mean age of the participants was 70.37±5.93 years. The majority were illiterate (84.78%) and had previously worked as housewives (91.30%). Regarding marital status, 60.86% were divorced, 30.43% were widowed, and 8.69% were single. Most participants (76.08%) had voluntarily chosen to stay at the facility, and 43.47% reported having no visitors. All participants were completely dependent on the facility for their primary needs.

Functional Abilities of Elderly Women Pre- and Post-Intervention

The mean scores and statistical comparisons of all outcome measures are shown in ***Table 2.*** Following the four-week yoga intervention, significant improvements were observed in all functional domains.

Physical Performance: SPPB scores improved significantly from 7.80±0.654 pre-intervention to 8.52±1.150 post-intervention ($p<0.001$), representing a 9.23

Hand Grip Strength: Grip strength increased significantly from 12.35±1.31 kg to 13.99±1.89 kg ($p<0.001$), showing a 13.28% improvement in the mean values.

Cognitive Function: Mini-Cog™ scores improved significantly from 3.00±0.874 to 3.80±0.401 ($p<0.001$), demonstrating a 26.67% enhancement.

Psychological Well-being: WHO-5 Well-being Index scores increased significantly from 57.83±4.596 to 77.39±6.705 ($p<0.001$), indicating a 33.82%

DISCUSSION

This pilot study demonstrated significant improvements in all assessed functional domains following a four-week structured yoga intervention among elderly women. These findings align with previous research while providing specific evidence for this vulnerable population.

The notable improvement in SPPB scores (9.23%) indicates enhanced lower extremity function, which is crucial for mobility and activities of daily living in older adults. These results are consistent with those of Tiedemann et al.[28] and Schmid et al.,[29] who demonstrated improved physical function and balance through yoga interventions in older adults. The progressive nature of our intervention, with

Table 1. Sociodemographic characteristics of the study participants (n=46)

Variable	Mean ± SD or n (%)
Age (in years)	70.37 ± 5.93
Sex	
Male	0(0)
Female	46(100)
Educational level	
Literate (just able to read and write)	7(15.21)
Up to HSLC	0(0)
Up to SSLC	0(0)
Graduate	0(0)
Post-Graduate	0(0)
Illiterate	39(84.78)
Previous occupation	
Unemployed	4(8.69)
Housewife	42(91.30)
Marital Status	
Single	4(8.69)
Married	0(0)
Divorced	28(60.86)
Widowed	14(30.43)
Separated	0 (0)
Number of Children	
01–02	17(36.95)
03–04	9(19.56)
05–06	2(4.34)
Nil	18(39.13)
Employment of children	
Working abroad	0(0)
Working in Kerala	0(0)
Working in another state	2(4.34))
Unemployed	44(95.65)
Nature of admission to the old age home	
Voluntary	35(76.08)
Forced by children	7(15.21)
Placed by relatives/others	4(8.69)
Duration of stay in the old age home	
Less than 1 year	8(17.39)
1-2 years	6(13.04)
2-3 years	7(15.21)
3-4 years	9(19.56)
More than 4 years	16(34.78)
Source of income	
Old age pension	0(0)
Own earnings	0(0)
Support from children	0(0)
Support from a relative	0(0)
Dependent on an old age home	46(100)
Do you suffer from any disease for a long time?	
Yes	2(4.34)
No	44(95.65)
Number of visitors you have	
1-2	24(52.17)
2-3	2 (4.34)
Nil	20(43.47)

Source: Study conducted at Apnaghar old age home, Agartala, Tripura, India (October 26th – November 26th, 2024).
*SD: Standard deviation

Table 2. Pre-intervention and Post-intervention Comparison of Functional Measures (n=46)

Outcome Measure	Pre-intervention (Mean ± SD)	Post-intervention (Mean ± SD)	P value
SPPB	7.80 ± 0.654	8.52 ± 1.150	<0.001
Hand Grip Strength (kg)	12.35 ± 1.31	13.99 ± 1.89	<0.001
Mini-Cog™	3.00 ± 0.874	3.80 ± 0.401	<0.001
WHO-5 Well-being Index	57.83 ± 4.596	77.39 ± 6.705	<0.001

Values are group mean ± standard deviation. P values based on Wilcoxon Signed Ranks Test (2-tailed).

systematic increases in frequency and duration, may have contributed to these outcomes.

Hand grip strength, a significant indicator of overall muscle strength and a predictor of functional limitations in elderly populations,[30] showed substantial improvement (13.28%) following yoga intervention. This finding aligns with that of Chen et al. [31], who reported increased grip strength following yoga interventions in elderly participants. The incorporation of Sukshma Vyayama movements, involving hand and wrist exercises, may have directly contributed to this improvement.

The substantial increase in Mini-Cog™ scores (26.67%) suggests enhanced cognitive functioning post-intervention. These results are consistent with the findings of Gothe *et al.*[32] and Eyre *et al.*[33], who documented improvements in executive functioning, attention, and memory following yoga interventions in older adults. The cognitive benefits of yoga are mediated through multiple mechanisms including increased cerebral blood flow, reduced stress and inflammation, enhanced neuroplasticity, and augmented brain-derived neurotrophic factor (BDNF) production.[34]

The remarkable improvement in psychological well-being (33.82% increase in WHO-5 scores) demonstrates the significant impact of yoga on mental health among institutionalized elderly women. This finding is particularly important given the high prevalence of depression and anxiety in institutional care settings, as documented in previous studies.[35,36]

This study has several limitations that should be considered. The single-group pre-test-post-test design without a control group limits the ability to attribute observed improvements solely to the yoga intervention, as natural recovery or placebo effects cannot be eliminated. The relatively small sample size and focus on a specific population (older women in one institutional care facility) may limit generalizability to other populations and settings. The brief intervention duration (four weeks) may not be sufficient to determine the long-term effects and sustainability of changes.

CONCLUSION

This pilot study demonstrated significant improvements in physical performance, grip strength, cognitive function, and psychological well-being following a four-week structured yoga intervention among older women residing in an old-age home in India. The results suggest that a well-designed, progressive yoga program can serve as an effective intervention to enhance functional capacity and quality of life in this vulnerable population.

Yoga's holistic approach, addressing physical, mental, and psychological dimensions of well-being, positions it well for promoting healthy aging among institutionalized older women. While further research with more robust designs is needed to confirm and extend these findings, this study provides preliminary evidence supporting the implementation of structured yoga programs as part of institutional care for older women to promote healthy aging and enhance their quality of life.

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Conflicts of Interest: There are no conflicts of interest.

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Approach to Unintentional Weight Loss in Older Adults

Rakesh Kumar[1]

Abstract

Unintentional weight loss (UWL) in older adults is a common yet often under-recognized clinical syndrome, associated with high morbidity, functional decline, frailty, and mortality. Defined as an involuntary loss of more than 5% of body weight over 6–12 months, UWL frequently signals underlying disease but can also be multifactorial or idiopathic. Etiologies include malignancy, chronic infections, endocrine and gastrointestinal disorders, psychiatric and neurological illness, adverse drug effects, and social determinants. A structured approach involving comprehensive history, physical examination, baseline investigations, and tailored diagnostic testing is essential. Management requires not only treatment of the underlying cause but also a multidisciplinary approach encompassing nutritional support, exercise, psychosocial care, and, in some cases, pharmacological therapy. This review outlines the epidemiology, common causes, diagnostic approach, management strategies, and prognostic implications of UWL in the elderly.

INTRODUCTION

Weight loss in th is often mistakenly attributed to 'normal aging.' However, clinically significant, unintentional weight loss—defined as a reduction of ≥5% of baseline body weight within 6 to 12 months—is an important red flag. It is associated with increased frailty, sarcopenia, impaired immunity, falls, institutionalization, and mortality.

Epidemiological studies suggest that the prevalence of UWL among community-dwelling older adults ranges between 15–20%, and is even higher in hospitalized patients and nursing home residents, where prevalence can exceed 25%. Importantly, unexplained weight loss may represent the first manifestation of malignancy, chronic infection, endocrine or gastrointestinal disease, or psychiatric illness.

The diagnostic challenge is compounded by the atypical presentation of diseases in the elderly, polypharmacy, multimorbidity, and the impact of social and functional limitations. Despite extensive evaluation, up to 25% of cases remain idiopathic. Identifying reversible causes is crucial, as timely intervention can significantly improve outcomes and preserve independence.

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Etiology of Unintentional Weight Loss

Category	Details
Malignancy	GI, lung, hematological cancers (20–36%)
Non-malignant Organic Causes	TB, HIV, Endocrine (thyrotoxicosis, DM), GI malabsorption, liver/renal/heart failure (30–45%)
Psychiatric/Neurological	Depression, Dementia, Parkinson's (9–24%)
Medication-related	Digoxin, SSRIs, Metformin, Chemotherapy drugs
Social/Functional	Poor dentition, Dysphagia, Isolation, Alcoholism
Idiopathic	No cause identified despite work-up (20–25%)

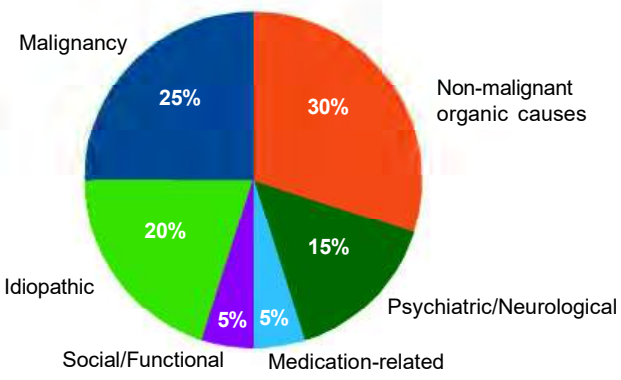
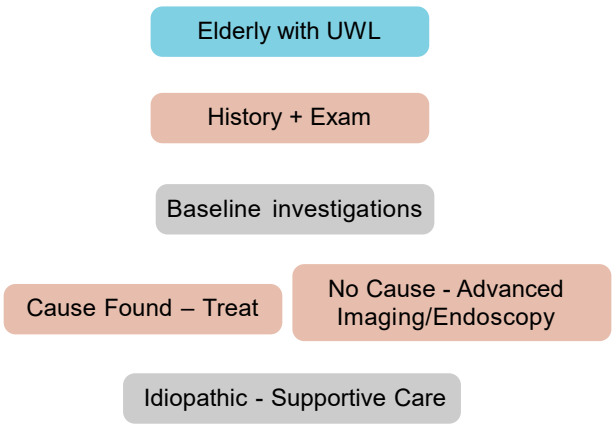


Figure 1: Distribution of causes of UWL in elderly

CLINICAL APPROACH

A systematic and patient-centered diagnostic strategy is key to identifying underlying causes.

1. History: weight trajectory, associated symptoms, medications, social background.
2. Physical exam: BMI, sarcopenia, oral cavity, lymph nodes, systemic and neurological assessment.
3. Baseline labs: CBC, ESR/CRP, renal/liver function, thyroid, glucose, albumin, B12, folate, urinalysis, stool occult blood.
4. Directed investigations: Imaging, endoscopy, TB/HIV screening, neuroimaging when indicated.



MANAGEMENT STRATEGIES

1. Treat underlying cause (infection, endocrine, malignancy, psychiatric).
2. Nutritional support: diet, supplements, micronutrient correction, enteral feeding if needed.
3. Exercise & rehabilitation: resistance training to reduce sarcopenia.
4. Pharmacological therapy: appetite stimulants (megestrol, mirtazapine), selective use.
   (A) *Appetite Stimulants*- Megestrol acetate: Improves appetite and modestly increases weight, but gains are mainly fat. Risks include thromboembolism, edema, and adrenal suppression. Use cautiously.- Mirtazapine: Antidepressant with appetite-stimulating properties. Useful in elderly with depression, insomnia, or anxiety.- Dronabinol: Synthetic THC. May increase appetite and improve mood but limited by CNS side effects such as dizziness and confusion.
   (B) *Anabolic and Anti-Catabolic Agents*- Testosterone/anabolic steroids: Beneficial in hypogonadal men but limited use due to risks (CV disease, prostate).- SARMs (Selective androgen receptor modulators): Under investigation, may improve muscle mass with fewer androgenic side effects.- Ghrelin agonists (anamorelin): Emerging agents showing improved appetite and weight in cancer cachexia, but not widely available.
   (C) *Anti-inflammatory and Metabolic Modifiers*- Thalidomide, omega-3 fatty acids (EPA/DHA), NSAIDs: Explored in inflammatory-driven cachexia with mixed results. Not routinely recommended outside trials.
   (D) *Micronutrient and Vitamin Supplementation*- Correct deficiencies in vitamin D, B12, folate, and zinc.- Oral nutritional supplements (ONS): High-calorie, protein-rich formulas (e.g., 400–600 kcal/day) are useful, especially in sarcopenia.
   (E) *Experimental and Limited Evidence Therapies*- Melatonin: May regulate appetite and sleep–wake cycle, but evidence is weak.- Growth hormone / IGF-1: Not recommended due to safety concerns and lack of strong evidence.
   Pharmacological therapy should always be combined with nutritional support, resistance exercise, psychosocial care, and treatment of the underlying cause.
5. Multidisciplinary care: physicians, dietitians, physiotherapists, psychiatrists, social workers.
6. Palliative/supportive care: focus on comfort in advanced disease.

Sarcopenia	**Cachexia**
- Age-related muscle loss - Gradual onset - Improves with nutrition + exercise	- Disease related wasting - Rapid onset - Driven by inflammation - Poor nutritional response

PROGNOSIS

UWL in the elderly carries poor prognosis with 1-year mortality of 15–30%. Persistent weight loss predicts frailty, hospitalization, and premature death.

DISCUSSION

Differentiating sarcopenia, frailty, and cachexia is crucial. Research gaps include biomarkers, pharmacological options, and

screening protocols. Clinical judgment, patient frailty, and quality of life should guide investigations. Multidisciplinary interventions remain underutilized.

CONCLUSION

Unintentional weight loss in the elderly is clinically significant. A structured, multidisciplinary approach is essential to identify reversible causes, support nutrition, address psychosocial issues, and improve outcomes.

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Hyponatremia in Older Adults: A Modifiable Geriatric Syndrome Driving Falls, Frailty and Functional Decline

Abhijina Veeramallu[1], Jayshree Swain[2*], Purna Chandra Dash[3], Santosh Kumar Swain[4], Sushree Jena[5], Saroj Kumar Jena[6]

Abstract

Hyponatremia is the most frequently encountered electrolyte abnormality in older adults and represents a growing challenge in geriatric medicine. Hyponatremia traditionally viewed as a laboratory disorder, increasing research indicates that it behaves more like a geriatric syndrome, with significant effects on mortality, bone health, cognition and physical function. Even mild stress can lead to age-related changes in thirst perception, neurohormonal functioning, renal water handling and body composition, diminish physiological reserve and render aged individuals more vulnerable to disturbances in water–sodium balance. Chronic hyponatremia is usually clinically trivial, so underdiagnosed, despite this it is strongly associated with gait instability, factures, falls, sarcopenia, cognitive impairment, institutionalization, and mortality. Diagnostic evaluation in older adults is challenged by polypharmacy, imprecise clinical volume assessment, and other frequent multifactorial etiologies. Crucially, new research indicates that treating chronic hyponatremia may enhance quality of life and functional outcomes. This review offers a thorough, practical overview of diagnostic and treatment approaches specific to geriatric medicine and reframes hyponatremia as a modifiable factor to frailty and undesirable ageing outcomes.

Keywords: *Hyponatremia, older adults, geriatric syndrome.*

INTRODUCTION: HYPONATREMIA AS A GERIATRIC SYNDROME

In older adults, hyponatremia is frequently observed; its prevalence rises consistently after 60 years of age and can reach 40–50% in hospitalized or institutionalized patients.[1,2] The risk is nearly 10-times higher in adults above the age of 80 years. Despite its prevalence, hyponatremia has long been thought of as an accidental biochemical anomaly rather than a disorder with clinical significance.

This perspective has transformed as, observational studies and meta-analyses periodically document associations between hyponatremia and outcomes that are crucial to geriatric medicine, that involve falls, fractures, cognitive impairment, extended hospital stays, institutionalization, and mortality.[3-6] Notably, these correlations are apparent even in mild and chronic hyponatremia, previously considered clinically irrelevant.

Similar to other geriatric syndromes, hyponatremia is prevalent, complex and associated with functional decline. It results from the interplay of comorbidities, polypharmacy, nutritional deficiencies, environmental stresses, and age-related physiological fragility. Conceptualizing hyponatremia as a geriatric syndrome rather than a distinct electrolyte abnormality has significant implications for diagnosis, treatment and research goals.

PHYSIOLOGICAL CHANGES

Age-Related Loss of Sodium–Water Homeostasis (Figure 1)

1. Impaired Thirst Perception

Ageing corresponds diminished thirst response to osmotic and volume stimuli.[7] As a result, older adults neglect to appropriately increase fluid intake during dehydration and remain susceptible to water overload when hypotonic fluids are consumed or encouraged.

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Dysnatremia in older populations is largely caused by this compromised behavioral defense system.

2. Altered Vasopressin Regulation

Arginine vasopressin (AVP) release is more sensitive to minor increases in plasma osmolality in older individuals.[8] Even at low salt concentrations, this increased reaction encourages water retention. Hence resulting in dilutional hyponatremia. Also, AVP release is further stimulated by non-osmotic stimuli such pain, nausea, illness, and routinely administered drugs, especially in frail persons.[9]

3. Renal and Body Composition Changes

The kidney's capacity to eliminate free water is compromised by age-related decline in tubular responsiveness, renal blood flow, and nephron number.[10] Loss of lean body mass also lowers total body water, which causes disproportionately significant changes in serum sodium concentration from minor absolute changes in fluid balance.[11] The margin of safety for preserving normonatremia in older persons is significantly reduced by all of these changes.

Epidemiology and Environmental Vulnerability

Hospitalized and long-term care residents have the highest prevalence of hyponatremia, which increases gradually with age.[1,2]

Heart failure, stroke, acute coronary syndrome, and pneumonia are some of the diseases where hyponatremia is a morbidity. If hyponatremia remains untreated, readmissions to the hospital will be more frequent.

There is a clear description of seasonal change, with a noticeable rise in the warmer months.[12] In the elderly population, mean outdoor temperatures above 20°C raise the likelihood of hospitalization due to hyponatremia. This is significant in light of global warming since hospitalization rates for hyponatremia are expected to increase by 6.3% with a 1°C rise and by 13.9% with a 2°C rise, according to climate models. Due to poor thermoregulation, decreased thirst, delayed tolerance to changes in sodium levels, and greater dependence on caregiver-directed fluid intake, elderly individuals are especially susceptible to heat-related hyponatremia.[13] Climate change is predicted to further increase the burden of hyponatremia in ageing populations, underscoring the need for proactive strategies in geriatric care.[14]

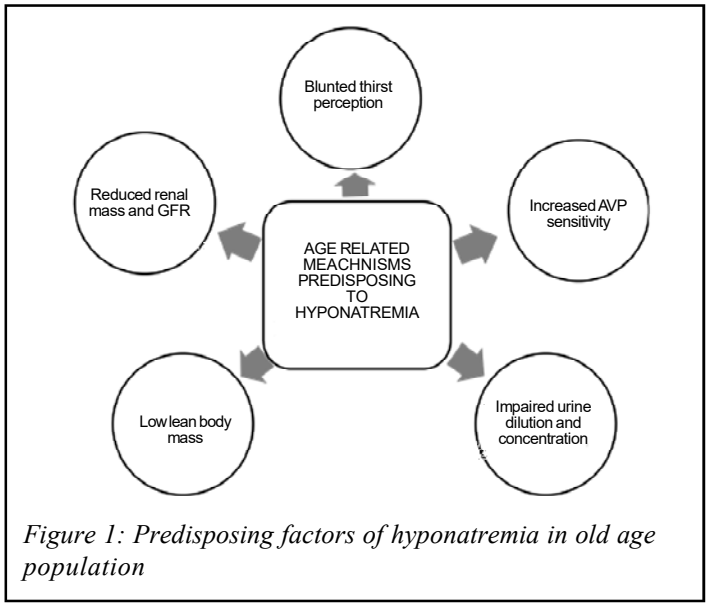

Figure 1: Predisposing factors of hyponatremia in old age population

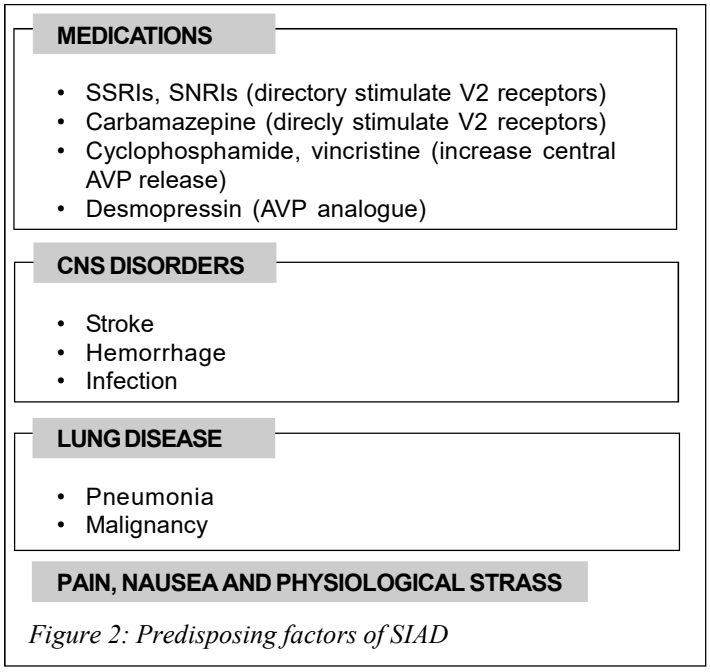

Figure 2: Predisposing factors of SIAD

Behavioural/Environmental

- Low solute intake
- Polypharmacy
- Multiple comorbidities
- Summer dehydration+ excess fluid intake

ETIOLOGICAL PATTERNS IN OLDER ADULTS (FIGURE 4)

Hyponatremia in geriatric population is generally multifactorial.[15]

1. Syndrome of Inappropriate Antidiuresis (Figure 2) and (Figure 3)

The most frequent cause of hyponatremia (euvolemia) in elderly individuals is SIAD.[16] Selective serotonin reuptake inhibitors, serotonin–norepinephrine reuptake inhibitors, antiepileptics, antipsychotics, and desmopressin are among the drugs routinely used in geriatric therapy that can trigger it.[17] Additional factors include lung disease, diseases of the central nervous system, cancer, and physiological stress.[18]

Crucially, SIAD is an exclusionary diagnosis that necessitates verification of normal thyroid and adrenal function, both of which may manifest atypically in older individuals.[19]

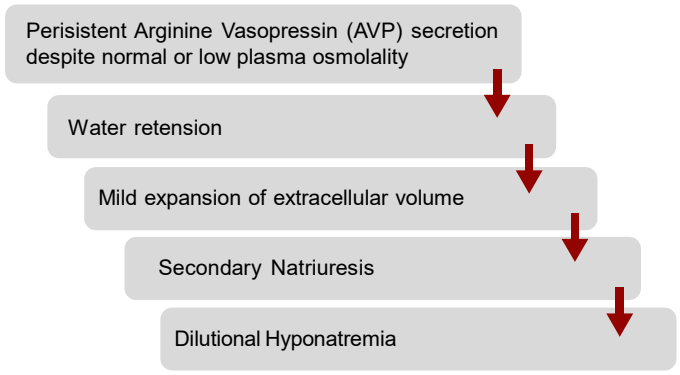

Figure 3: Mechanism of SIAD

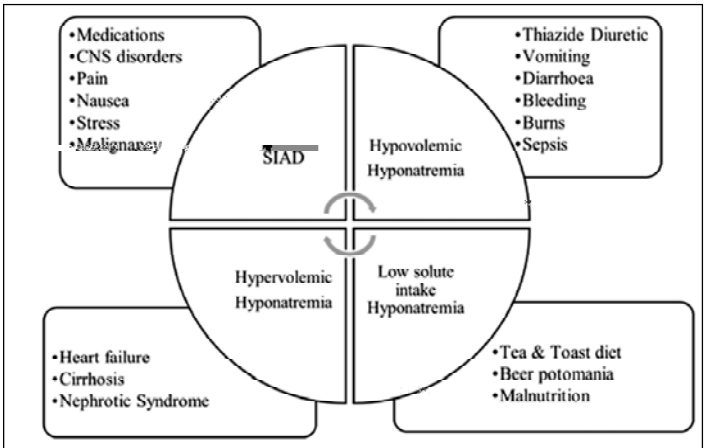

Figure 4: Etiological factors for hyponatremia

2. Hypovolemic and Diuretic-Associated Hyponatremia

Sodium loss is more than fluid loss. Due to diuretic use and fragility, the elderly population is particularly vulnerable to this. In older adults, especially women, thiazide and thiazide-like diuretics are a major cause of hyponatremia, nearly observed in about 20% of thiazide diuretic users.[20] Hyponatremia may develop weeks or months after initiation of diuretic therapy, complicating causal attribution. Sodium loss by thiazide diuretics, in turn causes fluid loss and even impaired urine dilution by DCT. Re-exposure typically reproduces hyponatremia and should usually be avoided.[21] Even significant fluid loss, activates AVP directed fluid retention and Renin Angiotensin Aldosterone System (RAAS) stimulation to preserve fluid and salt.

3. Hypervolemic Hyponatremia

Older individuals who have heart failure, liver cirrhosis, or advanced kidney disease are more susceptible to develop hypervolemic hyponatremia resulting from neurohormonal activation.[22] Excessive fluid retention and sodium dilution (water retention > sodium retention) are caused by low effective arterial blood volume, which activates neurohormonal systems such as AVP and the renin-angiotensin-aldosterone system (RAAS). The conflicting dangers of hypotension, renal failure, and polypharmacy make management challenging.

4. Low Solute Intake and Malnutrition

Low sodium and protein consumption restricts the amount of free water excreted by the kidneys and increases the risk of dilutional hyponatremia.[23] This mechanism, is typical in fragile elderly persons with limited appetite or social vulnerability and is often disregarded until nutritional history is thoroughly evaluated.

FUNCTIONAL CONSEQUENCES OF HYPONATREMIA (FIG: 5)

In acute hyponatremia that is less than 48 hours, the brain cannot adapt quickly so in turn develop cerebral edema. There is a high risk of herniation and warrants immediate management. Whereas in chronic hyponatremia, the brain has time to adapt via loss of osmolytes. Chronic hyponatremia may appear asymptomatic but can cause significant functional impairment.

FEATURES OF CHRONIC HYPONATREMIA

1. Gait, Balance, and Falls

Chronic hyponatremia is associated with impaired gait stability, slowed reaction time, and increased fall risk.[3,28] Even mild hyponatremia confers a fall risk comparable to that associated with advanced ageing. These abnormalities are comparable to mild alcohol intoxication. Improvement is observed upon correction of sodium levels.

2. Cognitive and Neuropsychiatric Effects

Chronic hyponatremia in elderly individuals manifests as minor deficits in executive function and attention.[29] These deficits might exacerbate pre-existing cognitive deterioration and make the individual more vulnerable to delirium during an acute illness.

3. Bone Health, Sarcopenia, and Frailty

Hyponatremia is independently associated with fragility fractures and osteoporosis.[3,30] Increased osteoclastic activity is observed. Once sodium levels are back to normal, the osteoclastin activity improves, this in turn enhances osteoblast function. Hip BMD is reduced even with mild hyponatremia.

Clinical research shows connections with sarcopenia and muscle weakness, whereas experimental studies indicate to direct impacts on bone metabolism.[31] Chronic hyponatremia facilitates cardiomyopathy, hypogonadism, and muscular atrophy in animal models. Together, these effects position hyponatremia as a contributor to frailty.

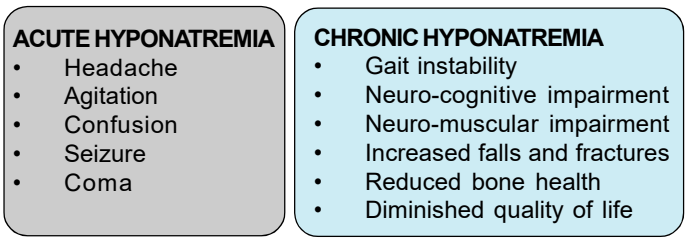

Fig:5 Symptoms of hyponatremia in old age population

Diagnostic Approach in Geriatric Practice (Fig:6)

Stepwise Approach to Diagnosis

A. Serum osmolality measurement: Diagnostic evaluation should begin with confirmation of hypotonic hyponatremia by measuring plasma osmolality (<275 mOsm/kg).[25]

B. Urine osmolality measurement: Once hypotonicity is confirmed, urine osmolality provides understanding of AVP activity. In older individuals, impaired renal dilution necessitates higher interpretive thresholds. Urine osmolality ≥200 mOsm/kg may indicate appropriate AVP suppression, whereas higher values (>200mOsm/kg) suggest persistent antidiuretic activity (SIAD/ hypovolemia).[26]

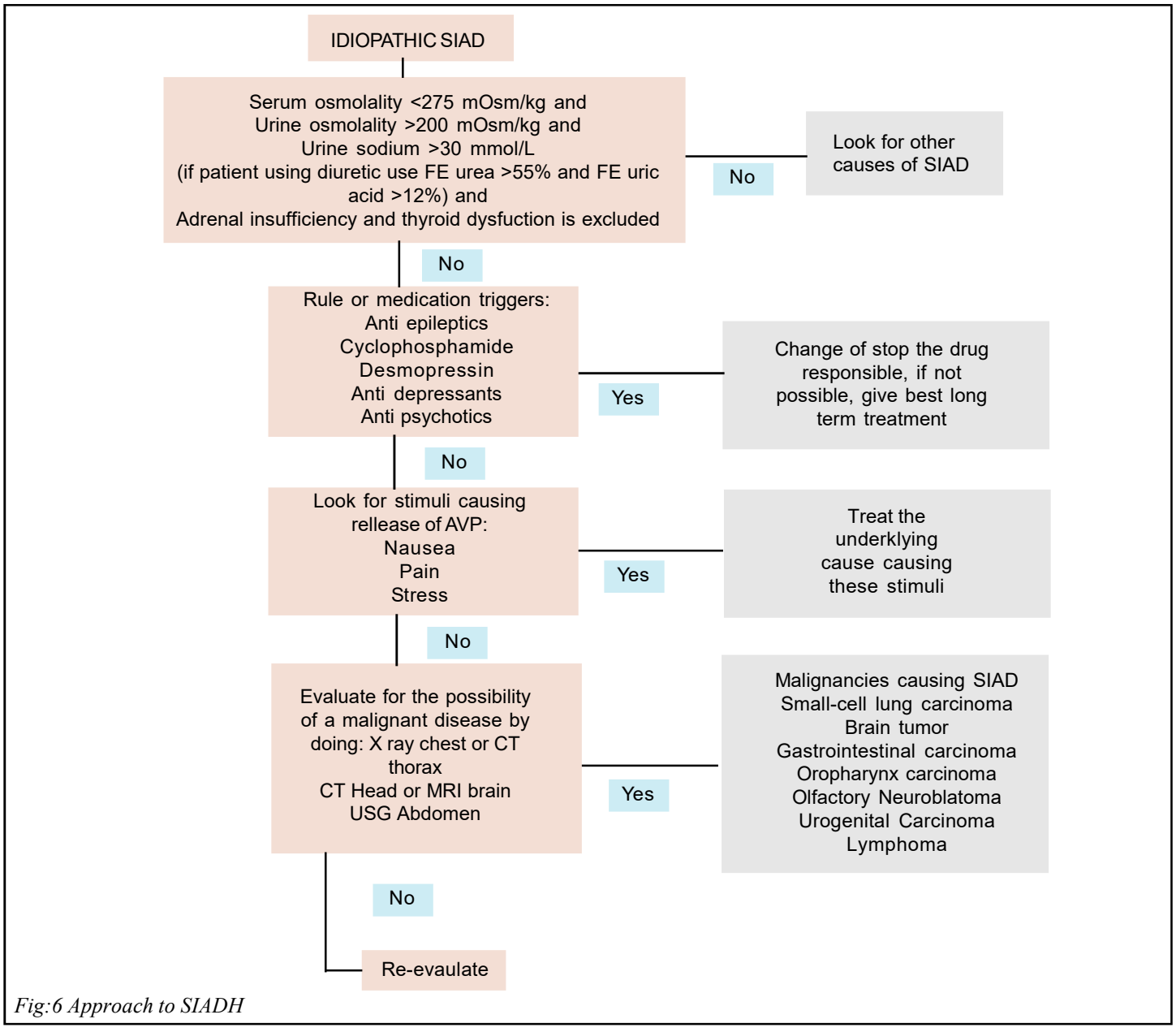

Fig:6 Approach to SIADH

C. Urine sodium measurement: Urine sodium ≥30 mmol/L is suggestive of hypovolemia whereas urine sodium of >30 mmol/L is indicative of SIAD or adrenal insufficiency. Urine sodium assists in etiological differentiation but is unreliable in those receiving diuretics. In such cases, fractional excretion of urea (FE Urea) or uric acid (FE Uric Acid) provides superior diagnostic accuracy and should be preferred.[27] In case of hypovolemia the FE Urea is <35% and the FE Uric Acid is <8% whereas in case of SIAD the FE Urea is >35% and the FE Uric Acid is >12%.
D. Clinical volume assessment: Volume status has poor sensitivity and specificity in older adults.[24] Orthostatic hypotension, reduced skin turgor, and peripheral edema may reflect ageing or comorbidity rather than true volume disturbance, leading to frequent misclassification.
E. Reassessment: Review all medications used by the patient. Exclude the presence of Adrenal Insufficiency and Hypothyroidism before making a diagnosis of SIAD.[19] Multifactorial hyponatremia is common, and failure to respond to initial therapy should prompt reassessment rather than escalation of treatment.

TREATMENT OF HYPONATREMIA IN OLDER ADULTS

1. General Principles

In geriatric practice, treatment goals should prioritize safety, functional improvement, and prevention of further decline rather than rapid normalization of serum sodium.[25] Correction rates must be conservative, particularly in malnourished or frail individuals, at high risk of osmotic demyelination (OD).[32]

2. Acute Symptomatic Hyponatremia

Acute symptomatic hyponatremia constitutes a medical emergency and requires prompt partial correction with 3% hypertonic saline.[25] Older adults are at increased risk of overcorrection due to low total body water and require close monitoring. In symptomatic acute hyponatremia correct up to 4–6 mmol/L in almost 4 to 6 hours. Sodium levels should be checked every 6 hours until the patient recovers from acute hyponatremia. 3% NaCl better to be given as bolus than continuous infusion (United states: 100 mL over 10 mins, Europe: 150 mL over 20 mins). Osmotic Demyelination a potentially devastating neurological complication occurs if rapid over correction is done in a short period of time. OD occurs due to damage to myelin because of osmotic stress. Patients with alcoholism, severe hyponatremia, advanced liver disease, hypokalemia and malnutrition are at highest risk. OD can be prevented in them with, even slower correction rates with 6–8 mmol/L within 24 h. Treatment with urea can be protective in various scenario.

3. Chronic Hyponatremia

Fluid restriction is the first line treatment for SIAD, often poorly tolerated and inconsistently effective in older adults, with potential adverse effects on nutrition and quality of life.[33] Fluid intake should be restricted to 0.5 to 1 lit/day. This is ineffective if Urine sodium is >130 mmol/L and Urine osmolality >500 mOsm/Kg.

Isotonic saline is appropriate for hypovolemic hyponatremia but should be avoided in SIAD, where it may worsen hyponatremia.[25] This therapy suppresses AVP stimulation and RAAS activity, there by replenishing both salt and water in turn triggering water diuresis.

Loop diuretics used mainly for treatment in case of hypervolemic hyponatremia, as it decreases the kidney's ability to reabsorb water leading to aquaresis. In low doses along with sodium tablets can be used as a second line treatment for moderated to severe SIAD.

Oral Salt Tablets are ineffective and it has no much added benefit even in combination therapy.

Oral Urea is a strong osmotic diuretic, which is well tolerated when appropriately dosed. Used for moderate to severe hyponatremia, fluid-restriction refractory SIADH. Body weight adapted dosage is recommended (0.25–0.50 g/kg/day), a starting dose of 30 g per day is used, can be increased to 60-90 g/day. In elderly start at 15 g/day; increase to 30–60 g. it can be as effective as tolvaptan. Side effects include increased risk of hepatic encephalopathy in patients with liver cirrhosis and poor palatability. It may reduce the risk of osmotic demyelination and represents a valuable option for SIAD in older adults.[34]

Vasopressin receptor antagonists promote water excretion without sodium loss by reducing the kidney's ability to reabsorb water through the aquaporin 2 channels. Tolvaptan, taken orally, while conivaptan is an intravenous option. Tolvaptan effectively raises sodium levels in patients with SIADH, heart failure, or liver cirrhosis. Treatment begins with lower dose – 7.5mg/day. They effectively correct hyponatremia but carry risks of overcorrection, severe hepatotoxicity, and high cost. Their use in older adults should be highly selective and closely monitored.[36]

Protein supplementation increases endogenous urea production naturally. Protein is metabolized into nitrogen, which later gets converted to urea in liver and is excreted. About 10 g of protein produces 50 mmol of urea. Daily 90 grams of protein increases serum sodium similar to 30 grams of urea. Protein also benefits by addressing sarcopenia and frailty. Emerging data suggest that increased protein intake can raise serum sodium and improve functional outcomes.[35]

SGLT2 inhibitors promote electrolyte-free water excretion by promoting excretion of glucose in urine, thereby leading to osmotic diuresis. Emplagliflozin raises the urine sodium by nearly 4 mmol/L. They are well tolerated and there is no need for fluid restriction. This causes modest sodium correction while offering cardiovascular and renal benefits, making them an attractive holistic option in multimorbid older adults.[37] Adverse effects such as Genito-urinary tract infection and euglycemic ketoacidosis can occur

All the treatment options and its functional benefits given in the below picture **(Fig:7).**

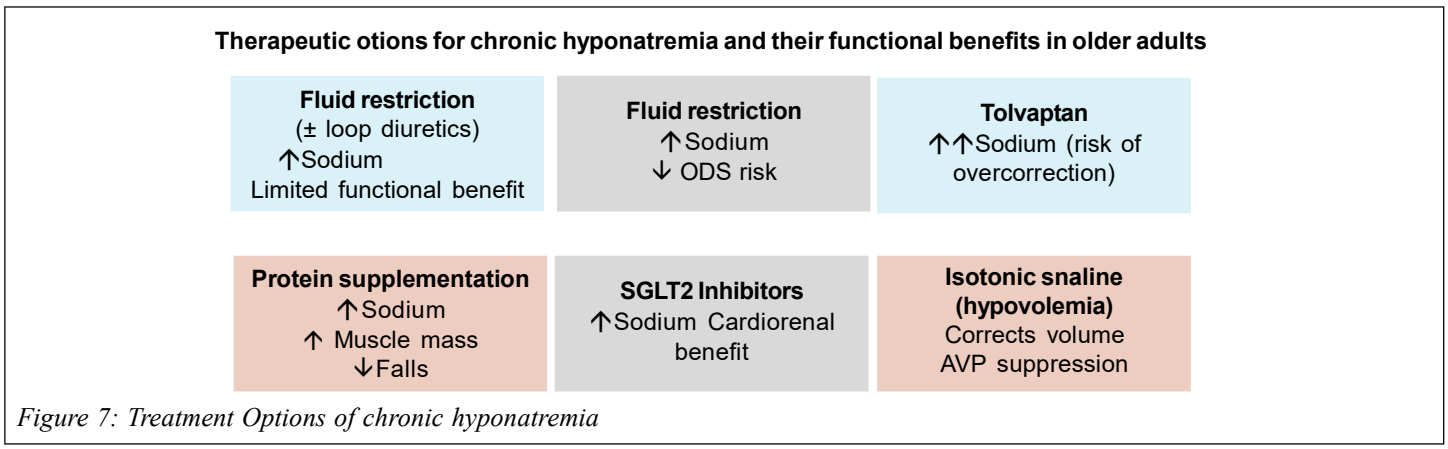

Figure 7: Treatment Options of chronic hyponatremia

HYPONATREMIA AS A FRAILTY AMPLIFIER

Hyponatremia interacts bidirectionally with frailty. While chronic hyponatremia accelerates decline through impacts on muscle, bone, gait, and cognition, age-related susceptibility predisposes to dysregulation of sodium. Understanding this cycle helps in distinguishing hyponatremia as one of the few potentially reversible contributors to frailty in older individuals.

CONCLUSION

In geriatric population, hyponatremia is more prevalent, complex, and have a definite clinical importance. It clearly falls within the category of geriatric syndromes because it causes falls, fractures, cognitive decline, loss of independence and all cause of morbidity. A geriatric-focused approach that emphasizes careful diagnosis, conservative correction, and functional outcomes may enhance quality of life and ageing trajectories.

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Spirituality in Geriatric Care

Chinmoy Kumar Maity[1]

INTRODUCTION

Frail older patients are at the center of a complex milieu of multi-factorial problems – Physical, Functional, Psychological, Socioeconomic, Nutritional, Environmental and Spiritual.[1] So, the proper management of the frail elderly should be holistic and it needs accurate and delicate skills to help them recover from difficult situations.[2]

The famous comedic actor Charlie Chaplin once said with a touch of humour that "Nothing is permanent in this wicked world, not even our troubles!" In reality, the truth is that whether good or bad, nothing lasts forever. As we all know, life is a balance sheet of 'Profits & Losses'. Along with the vast experiences of life, old age comes with a package of deficits and losses, many of which cannot be cured/ compensated for. Spirituality helps us develop appropriate positive attitudes to accept these stark facts of life with a smile and enjoy life till the end.[3,4]

MEDICINE AND RELIGION IN ANCIENT INDIA

The ancient Indian system of medicine is considered to be the oldest medical system in the world (@3000 BCE).[5] Ancient Indian tradition of medicine has its origin stretching from the mythical to the non-mythical. Mythologically, the first exponent of medical science was none other than the creator **Prajapati Brahma** himself.[6] However, historically **Atreya** (700 – 600 BCE), the physician and **Susruta** (800 – 700 BCE), the surgeon were the first founders of medical science.[5] The earliest historical references to healing in India go back to the Vedic period (1500 – 500 BCE) (or maybe even 3000 BCE ago).[6] In Atharva Veda (1200 – 900 BCE), we find the beginning of the art of healing and knowledge of healing herbs. Atharva Veda, the precursor of Ayurveda contains 114 hymns devoted to medical topics like fever, wounds, leprosy, heart disease, epilepsy, insanity, eye and ear diseases.[5,6] The treatment of diseases in Atharva Veda was largely comprised of religious ritualistic practices – mantra, niyama, upavasa, prayaschitta etc.[5]

MEDICINE AND RELIGION IN THE ANCIENT WORLD

Early (@2600 BCE) written documents show Egyptian/ Mesopotamian healers were priests with magico-religious concepts.[7,8] In Greece, **Asclepius** was considered the Greek God of Medicine & **Hygieia**, one of the 5 daughters of Asclepius was considered the Greek Goddess of Health. The rod of Asclepius with a snake intertwined remains a symbol of medicine today.[7] From 5th century BCE onwards, the cult of Asclepius grew more popular and pilgrims flocked to its healing temples. Hippocrates (460 - 370 BCE), traditionally known as the "Father of Medicine" began a more scientific approach and for the first time he suggested that diseases are caused by natural causes.[7]

In the Christian era healings were attributed to Lord Jesus who sometimes linked healing to the forgiveness of sins. By the 5th century AD, virtually all physicians were from the monastic communities. Secular medicine emerged in the late middle age, but was still under the control of the church. In 1140 AD, the church granted the first medical licenses with necessary prerequisite conditions and reasons for revocation of the licenses.[9]

Cartesian philosophy, developed by Rene Descartes (1596 – 1650 AD), centred on rationalism and mind-body dualism which lead to the separation of mind and body. In 1789 the French Revolution marked the breakdown of religious control over medicine.[2]

SPIRITUALITY IN VEDANTIC PHILOSOPHY

Any discussion on spirituality can never be complete without discussing vedantic philosophy, the oldest scripture in the world. According to vedantic philosophy, as Swami Vivekananda explained,

"the fact is that man in his true nature is already divine; but this divinity is covered. Life's one purpose is the realization of this divinity. Realization of divinity is religion. At base all religions teach this same truth although accretions often obscure it. Vedanta emphasizes the one objective of realization but accepts diverse methods of reaching it."

"Realization may be gained by the practice of any one or a combination of the following yogas:

1) Yoga of Knowledge (Jnana Yoga).
2) Yoga of control of Mind (Dhyana / Raja Yoga).
3) Yoga of selfless Work (Karma Yoga)
4) Yoga of love of God (Bhakti Yoga)."[10]

"When the world is the end and God the means to attain that end, that is **materialism**. When God is the end and the world is only the means to attain that end, **spirituality** has begun."[10]

[1]Senior Consultant Geriatrician, Manipal Hospitals, Kolkata.

RELIGION	SPIRITUALITY
Community-focused.	Individual-focused.
Observable, measurable, objective.	Less visible and measurable, subjective.
Formal, orthodox, organized.	Less formal, unorthodox.
Behaviour-oriented, outward practices.	Emotionally-oriented, inward directed.
"Good/ Evil" doctrine.	Non-doctrine oriented.
Authority directed.	Self-directed.
Religious practices – prayer, reading scriptures etc.	Spiritual practices – meditation, relaxation, listening to music, etc.

Spirituality is a broad concept that involves a deep, often religious, sense of meaning, purpose and connection to something larger than oneself, such as a higher power, nature or community.

- Spirituality goes beyond material concerns and includes a search for inner peace, personal growth and a sense of being interconnected with others and the world.
- While spirituality can be expressed through religion, it is often a more personal, individual experience and beyond religion.

Religion is defined as a set of organized beliefs, rituals and practices, usually embodied within an institution or an organization, with an objective of the realization of divinity.

The differences between religion and spirituality are as follows:

MODERN MEDICINE AND RELIGION

The interest in spirituality and ageing has increased significantly in recent years. The medical literature on religion and spirituality has increased by 600% between 1993 and 2002! This is due to the overwhelming evidence of positive health outcomes linked to spiritual and religious practices.

Psychological and gerontological theories confirm that there is an increased need of spirituality in late life. [1]

Increasing longevity in modern society puts **the spiritual needs of the elderly at the forefront of immediate societal needs.**

Given the issues of **loss, physical illness and death** confronted in old age, understanding an individual's spiritual perspective becomes increasingly important.

A famous quote is very relevant here:

"Science and religion have the same origin: both are generated naturally in the human mind … it is, therefore nonsense to inquire whether the existence of the one is compatible with that of the other. They are able to coexist seeing that they do coexist. The only problem is that of seeking out the reason and meaning of this coexistence." … (Emile Boutroux, 1909).

Despite the controversy, the role of religion and spirituality in healthcare is growing. A recent survey amongst US general population revealed the following: [1]

- >90% Americans believing in God or a higher power.
- 90% are praying (67-75% praying daily).
- 69% being members of a church or synagogue.
- 60% considering religion to be very important in their lives.
- 82% acknowledging the need for spiritual growth.

There is also evidence from research that patients want to be seen and treated as a whole person, not as disease states. Being a whole person implies having physical, mental, emotional, social and spiritual dimensions and ignoring any of these aspects can interfere with healing. Over 75% patients want their physicians to include spiritual issues in their care. [11]

The guidelines of the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) require hospitals to meet the spiritual needs of the patients. The DSM-IV and DSM-V Research Agenda specifically addressed significant roles of religious and spiritual issues in psychiatric diagnosis and management. A recent survey by Fortin & Barnet amongst 53 medical schools revealed that 64% included teaching about spirituality, faith and prayer. [11,12,1]

Christina M. Puchalski from the George Washington Institute for Spirituality and Health (GWish), recommended step-wise integration of training in spirituality into the medical school curricula.

Some authorities have recommended that physicians should record the religious and spiritual histories of their patients to better understand their backgrounds and beliefs for a holistic practice of medicine. Spirituality can be taught in the context of compassionate communication skills training, especially in end-of-life care. [11,1]

A study of over 20,000 US adults estimates that religious involvement prolongs life by approximately 7 years. Religious beliefs buffer the effects of stress on mental health and may help patients cope and provide them with an additional sense of purpose to fighting their diseases. [1]

Various systematic reviews and meta-analyses have demonstrated that religious involvement correlates with decreased morbidity and mortality. [1]

- In Comstock and Partridge's analysis of 91,000 people in Maryland (USA), those who attended church had a lower prevalence of cirrhosis, emphysema, suicide and death from IHD.
- Koenig and colleagues reviewed 325 studies and found a significant relationship between religious involvement and better mental health, physical health and the use of health services.
- A review of 24 studies in research literature found that religiously involved people had fewer depressive symptoms and less depression and anxiety.
- About 80% of existing research has also suggested an inverse correlation between religiosity and suicide.

SPIRITUAL NEEDS OF THE ELDERLY

Spirituality is crucial for the well-being of older adults. It provides meaning, purpose and coping mechanisms for ageing challenges like illness, loss and physical decline, enhancing resilience and

reducing depression. So, the spiritual needs of the older people can be categorized as follows: [1,9]

1) Finding meaning and purpose of life.
2) Coping mechanism and enhancing resilience.
3) Connectedness with something bigger than life.
4) Love and being loved.
5) Sense of belonging.
6) Gratitude and Forgiveness.
7) Hope and Peace.

ASSESSMENT OF SPIRITUALITY

There is no universally accepted guideline for assessment of spirituality in clinical practice. [12] However, according to certain authorities in the field, this can be started by asking four simple questions as follows: [1]

1) Is faith (religion, spirituality) important to you as you fight this illness?
2) Has faith been important to you in any other times in your life?
3) Do you have someone to talk to about religious matters?
4) Would you like to discuss religious matters with someone?

There are several spiritual history tools to help obtain a spiritual history: [1]

1) **FICA** (CM Puchalski, 2000) – Faith / Importance / Community / Apply / Address.
2) **HOPE** (G Anandarajah & Hight, 2001) - Source of Hope / Organized religion / Personal spirituality / Effect on medical and end-of-life care.
3) **SPIRIT** (Todd Maugans, 1996) – Spiritual beliefs / Personal beliefs / Integration with spiritual community / Rituals / Implication for care / Terminal care.
4) **FAITH** (King, 2002) – Faith / Apply / Involved / Treatment / Help.
5) **FACT** (Mark LA Rocca-Pitts, 2008) – Faith / Availability / Coping / Treatment.
6) **KUHN'S Evaluation** (Clifford Kuhn, 2018) – Meaning / Purpose / Belief & Faith / Love / Forgiveness / Prayer / Meditation & Worship.

MEASURES OF SPIRITUALITY

There is no widely accepted consensus on parameters/ measures for assessment of spirituality, but several spiritual assessment scales are used in clinical practice and research as follows: [1]

1) **SWS** (Spiritual Wellbeing Scale).
2) **SPS** (Spiritual Perspective Scale).
3) **EWBS** (Existential Wellbeing Scale).
4) **RWBS** (Religious Wellbeing Scale).
5) **DSES** (Daily Spiritual Experience Scale).
6) **HHI** (Herth Hope Index).
7) **DAP** (Death Attitude Profile).
8) **MMRS** (Multidimensional Measurement of Religiousness/ Spirituality.

SPIRITUAL INTERVENTIONS

The spiritual care of the elderly starts with spiritual assessment in a suitable environment in which a person's religious, spiritual and cultural beliefs and values are safeguarded. A supportive, compassionate and trusting relationship is a vital issue for the elderly to open up and talk about the deeper issues of their lives. Generating a sense of hope and connectedness to something bigger than life is another important element of spiritual care that has to be kept in mind by the person dealing with this, i.e. the chaplains or physicians. The components of spiritual care interventions include – prayer, rituals, reading scripture, reminiscence, story-telling, meditation, mindfulness and mindful exercises like Yoga, Tai Chi etc. [1,9]

Numerous trials have consistently shown significant positive health benefits of the following spiritual interventions: [1,9]

1) **Prayer, worship and religious rituals** – which varies according to different religious practices.
2) **Meditation** – Meditation involves either the:
a. Narrowing/ focusing of the attention on internal events, such as breathing, an object, one point in space or a mantra. OR
b. Expanding the attention non-judgmentally on moment-to-moment experiences, and observing thoughts and feelings from a meta-cognitive awareness state (mindful meditation).
3) **Mindfulness meditation** – Mindfulness is defined as a conscious discipline of paying attention to the present moment in a particular way and in a non-judgmental state (Key elements: intentionality/ present-centeredness /absence of judgment).
4) **Mindful Physical Exercises – Yoga / Tai Chi / Qigong.**

Yoga is a Hindu spiritual discipline which includes breath control, simple meditation and the adoption of specific bodily postures. This is widely practiced for health and relaxation. The word "Yoga" is derived from the Sanskrit root "YUJ" meaning to bind, join, attach, yoke or unite, to direct and concentrate one's attention to use and apply. In the Bhagavad Gita, yoga is defined as the path to spiritual realization and self-union with the divine. It is not just a physical practice but a holistic discipline that encompasses the mind, body and spirit. The Gita emphasizes that yoga is about mastering the self, transcending ego and realizing the eternal connection with the Supreme Being, thereby leading to a life of balance, clarity and spiritual wisdom. Different types of yoga have been outlined in the Gita – Karma Yoga, Bhakti Yoga, Jnana Yoga and Dhyana/ Raja Yoga.

Qigong is a Chinese system of physical exercises and breath control. "Qi" means "life energy" that flows through all living things and "Gong" means to "work or cultivate". Qigong, also known as Chi Kung is a broad system of cultivation of life energy using breath, movement and meditation for health. In Qigong, the five elements – Wood, Fire, Earth, Metal and Water are a vital framework for understanding and manipulating the body's energy dynamics.

Tai Chi, also known **Taijiquan** is a form of Qigong and consists of specific and structured martial art. The word "Tai" means "Supreme", "Ji" or "Chi" means "Boundary" and "Quan" means "Movement". Together the term "Taijiquan" implies a method of

movement to cultivate a form of power that has no boundary. Tai Chi, is a gentle, low-impact Chinese exercise combining slow, flowing movements performed in a continuous circular manner, deep breathing and mindfulness, acting as "meditation in motion" to improve balance, strength, flexibility and mental well-being by harmonizing body and mind.

BARRIERS TO SPIRITUAL ASSESSMENT

There are several barriers to spiritual assessment in clinical practice as follows: [12]

1) The lack of professional training for the healthcare professionals.
2) Shortage of time.
3) Discomfort in patients and healthcare providers in discussing spiritual issues and needs.
4) Absence of a universal agreement on measures of religiousness and spirituality and validated tools.
5) Lack of continuity of care and lack of privacy.

HARMFUL EFFECTS OF FAITH ON HEALTH

So far, we have discussed the positive effects of faith (religion/ spirituality) on health outcomes, but there are also some harmful/ negative effects of faith on health outcomes as follows: [2]

1) Avoidance or discontinuation of traditional treatments, e.g. issues with blood transfusion (in Jehova's witnesses), vaccination, contraception, MTP, amputation etc.
2) Faith can stigmatize people against certain diseases like HIV, Leprosy, TB etc. and prevent them from getting proper treatment.
3) Some religious practices, such as exorcism (rituals to get rid of demons/ ghosts from the body) of the patients can be dangerous and lead to death.
4) Fanatic religious beliefs can affect physical and mental health adversely, e.g. handling dangerous snakes and drinking poison during worship etc.
5) Sometimes religious beliefs can lead to increased anxiety and depressive symptoms.

IMPLEMENTATION OF SPIRITUALITY IN LIFE

Implementation of spiritual practices in life begins with the understanding and acceptance of the truths of this life and the world. The philosophy of life guides us to accept different spiritual practices. The most vivid example is that of the life of lord Gautama Buddha who established Buddhist Philosophy and Buddhism. [13,14]

Buddhist Philosophy

Young prince Siddhartha, during his city tour before accession to the throne, witnessed 4 aspects of this life:

1) A very frail elderly man – **Jara.**
2) A very sick old lady – **Byadhi.**
3) A dead man – **Mrityu.**
4) A holy monk – **Sannyas.**

He was seriously moved and became restless to know the ultimate fate of this body. He sacrificed everything and left home in search of the truth about this life and the world and had the realisation of the "TRUTH" after achieving "NIRVANA" through austerity / deep meditation for years.

Realizations of Gautama Buddha – 4 Truths of life (Arya-satya):

1) There is **pain & sorrows** in life – Jara / Byadhi / Mrityu / Failures etc.
2) There is a **reason** for this – Trishna / Desire.
3) There is **cure** for this – Nirvana / Enlightenment.
4) There are **ways** to achieve Nirvana – Astanga-Marga. (Eightfold Path of Right practices – View, Intention, Speech, Action, Livelihood, Effort, Mindfulness and Concentration).

This is exactly similar to modern day medical practices, conforming with the format of - Symptoms / Cause / Treatment / Ways of Treatment of illness.

Many years after the young prince Siddhartha achieved "Nirvana" and became Gautama Buddha, one of his disciples asked him – "Lord, you as a prince sacrificed everything and left home in search of the truth and the ways to conquer pain and sufferings in the forms of Jara, Byadhi and Mrityu. But we can see that, like others, you are also suffering from "Jara" and "Byadhi" and one day you will also leave this mortal body, i.e. you will have to accept "Mrityu" as well. So, what did you really gain from so many sacrifices and lifelong spiritual practices?"

Gautama Buddha answered with a smile –

"In fact, rather than gain, through my sacrifices and lifelong spiritual practices I have lost many things – Lust/Desire, Anger, Greed, Attachment/Delusion, Ego/Pride, Jealousy/Envy, Anxiety and Fear. It has helped me not only to understand, but also to accept the laws of this universe and the truths of life."

Then he explained how spirituality helps to conquer pain and sufferings in life. He expressed that when we suffer from pain and sufferings, we are simultaneously pierced by two arrows:

i) **The first arrow** is the first Arya-Satya, i.e. problems in the forms of Jara, Byadhi, Mrityu, Failures etc – this is unavoidable and every single entity in this world including "Avatars" will have to suffer from this and

ii) **The second arrow** is our reaction to the first arrow and this is more important than the first one, as it determines degree of sufferings and the outcome. Practice of spirituality helps us modify or even nullify the effects of the first arrow.

How to conquer/ go beyond pain & sorrows in this world?

Life-long spiritual practice is the clue to conquer pain and sufferings in this world and it helps us through:

- Understanding and accepting the laws of this universe and the truths of life.
- Accepting the concept of being pierced by two arrows:

1) The First Arrow – the first Arya-Satya, which is universal and unavoidable.

2) The Second Arrow – Our Reactions to the first arrow, which is modifiable through Spiritual Practices.

Vedantic Philosophy

According to "Veda" there are four stages / "Ashrams" of life **(Chaturashram)**:

Bramhacharya / Garhasthya / Banaprasthya / Sannyas. [15]

1) **Bramhacharya & Garhasthya** – are the phases of increasing attachment with this world.
2) **Banaprasthya & Sannyas** – are the phases of increasing detachment from this world

Swami Ranganathananda, the 13th President of the Ramakrishna Mission order, while preaching vedantic philosophy during his annual lecture tour in the USA in 1982, discussed this Chaturashram concept of human life as depicted in Veda, the oldest scripture in the world. In one of these meetings, an American audience asked Swamiji – "Swamiji, Is this **"Chaturashram"** concept of life applicable to the technologically advanced modern western civilization?" [15]

Swamiji answered with a smile:

1) Oh yes, but it will need some suitable modifications according to time, place & person.
2) If we can respect this wonderful concept of life, our modern western civilization will gain immense strength, peace of mind and fulfilment.

Modern Philosophy

Carl G Jung (1875–1961), one of the most influential psychologists from the first half the twentieth century from Switzerland, wrote in his famous book **"Modern Man in Search of a Soul"** that human life has two distinct phases or periods: [16]

1) **Forenoon period** – the first half of life, also known as the phase of "**Achievement**".
2) **Afternoon period** – the second half of life, also known as the phase of "**Inner Enrichment / Culture**".

He explained that –

1) **In Forenoon phase** – we have to find our feet in this world. Here we are just used by nature as an instrument for nature's work and we are not free.
2) **In Afternoon phase** – we have to grow to a higher (spiritual) direction to feel free and fulfilled through our own personality enrichment by inner culture.

He also warned that - "If you continue what you did in the first part into the second part, you are in for trouble!"

In this context, I would like to share my own experience of how I deal with this issue in my everyday clinical practice. During routine clinical consultation if I find that the patient is showing evidence of **lack of awareness about/ denial to accept the stark facts of life with unrealistic & irrational expectations from life and the world**, I ask them the following question: "Which of the following groups do you think you belong to?

A – Atheist / Non-believer.

B – Believer / Theist.

P – Pendulum / Agnostic."

If they are a believer, then I ask them "What does faith mean to you?"

If they are an atheist, then I ask them "Do you believe in yourself?" and "Who are you, do you think?".

Then I ask all of them the following three questions:

1) How much control do you have over your own life events?
2) Do you feel that everything in this world is happening for a reason?
3) Do you feel that a higher power/ nature is controlling everything in and around us?

Most of the time, they admit that they have very little or no control over their life events and they feel, even if an atheist, that a higher power/ nature is controlling everything in and around us. This is the point where they become receptive and listen to issues on spirituality and religion.

In conclusion, I would like to quote two famous quotations of Sir William Osler, the Father of Modern Medicine and their implications in modern day Geriatric Practice.

1) "The good physician treats the disease; but the great physician treats the patient who has the disease". à A good physician is not good enough, you have to be a great physician to be a geriatrician.
2) "He who studies medicine without books sails an uncharted sea, but he who studies medicine without patients does not go to sea at all". à Treating the frail elderly without discussing spirituality, is like not treating them at all.

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Delirium In The Older Adult: A Case Report

Anita Basavaraj[1], Khushi Singhal[2], Sagarika Basavaraj[3]

INTRODUCTION

Delirium affects an estimated 14–56% of all hospitalized older patients[1]. Hospital-based delirium results in a four-fold increase in patient mortality after two-and-a-half years post-ICU admission[1]. Delirium is a common and serious acute neuropsychiatric syndrome with core features of inattention and global cognitive dysfunction[1]. The etiologies of delirium are diverse and multifactorial and often reflect the pathophysiological consequences of an acute medical illness, medical complication, or drug intoxication[1]. Delirium can have a widely variable presentation, and is often missed and underdiagnosed. At present, the diagnosis of delirium is clinically based. Management strategies for delirium are focused on prevention and symptom management[1].

In elderly individuals, delirium can initiate or otherwise be a key component in a cascade of events that lead to a downward spiral of functional decline, loss of independence, institutionalization, and in some cases, death.

CASE

A 61-year-old male patient came with complaints of breathlessness on exertion for the past two years, with a history of one episode of syncope two months back. Breathlessness was gradually progressive and associated with excessive sweating, dizziness, and retrosternal chest pain, which was non-radiating. The patient had one episode of loss of consciousness for ten to fifteen minutes, which was associated with giddiness. He was a known case of Hypertension for six years on regular medication with no other significant past or family history. Patient denied history of addictions.

Patient was evaluated for the above complaints, and 2D echo was done, which was suggestive of Rheumatic valvular heart disease with severe mitral stenosis and severe atrial stenosis with severe pulmonary arterial hypertension and dilated right ventricle and atrium.

The patient was subsequently posted for elective Double Valve Replacement and admitted to the cardiac ICU of a tertiary care hospital.

On initial investigations, hemogram, serum electrolytes, renal and liver function tests were within normal limits.

The patient was operated on after ten days of ICU stay. On post op day one, the Patient developed symptoms of irrelevant talk, agitation, and drowsiness with a fluctuating course. Psychiatry review was done for the patient, which was suggestive of delirium secondary to post-operative status and dyselectrolemia, and advised Tab olanzepine 2.5 mg HS.

Treatment: Patient was treated with Intravenous antibiotics for active infection and 0.45%NS for dyselectrolemia. Antiplatelets and rate control drugs were continued for cardiovascular disorder. Tab olazenpine 2.5 mg HS was given for three days, and SOS if agitation. Five days after initiation of the above treatment patient showed improvement in general condition along with laboratory parameters as shown in table 1. The patient was shifted to the general ward and discharged after two days.

Thus, we had a case of delirium in the elderly due to dyselectrolytemia, successfully treated.

Table 1: Post-operative Lab Investigations

Investigations	Post-operative day One	Post-operative day five (After Treatment)
Sr. Na (133-145 meq/L)	154meq/L	133meq/L
Sr. K (3.5 -4.5 meq/L)	4.6meq/L	3.5meq/L
Sr. urea (8-30 mmol/L)	112mmol/L	40mmol/L
Sr. creatine (0.2-1.3 mmol/L)	2.84mmol/L	1.16mmol/L
Hemoglobin (11-15 mg/dL)	9.2mg/dL	11.8mg/dL
Total leukocyte count (5500 -11000 cells/dL)	19700 cells /dL	11200 cells/dL
Platelets (150000-250000 cells/dL)	98000 cells/dL	165000 cells/dL
SGOT (0-40 U/L)	307.3 U/L	52 U/L
SGPT (0-40 U/L)	581 U/L	100 U/L

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MANAGEMENT OF DYSELECTROLEMIAS

Dyselectrolemias, in forms of hyponatremia, hypernatremia, hypokalemia, etc., can lead to several complications in patients and hence should be treated with utmost priority.

1. In Hypernatremia, the primary goal is restoration of serum tonicity. Patients with acute hypernatremia are treated with a more aggressive approach to prevent convulsions and other complications. In chronic hypernatremia, a slower approach is preferred.[3]
   a. Free water deficit is calculated by the formula = Total Body Water x [(sr. Na/140)-1]
   b. Ongoing fluid losses through urine, sweat, etc., are also considered
   c. This deficit is corrected over a few days with a rate of correction ~ 8-10meq/l per day.
   d. Total deficit is then corrected with the use of D5 or 0.45% NS or free water
2. Hyponatremia treatment depends upon the cause.[3]
   a. Hypovolemia hyponatremia is treated with isotonic saline
   b. Euvolemic hyponatremia (SIADH) is managed with fluid restriction, with vaptans and demeclocycline as second-line therapy
   c. Hypervolemic hypernatremia is primarily treated by fluid restriction and loop diuretics, and occasionally supplemented by vaptans
   d. In Acute hyponatremia (<48hrs), aggressive treatment with 3% NaCl is preferred as boluses of 100ml
3. Hypokalemia in a patient is treated according to symptoms and by addressing the cause [3].
   a. Mild to moderate hypokalemia is treated with oral potassium supplements
   b. Severe cases and where oral therapy is not tolerated, intravenous potassium correction is given as 40mmol in 500ml NS over 3-4 hours and can be repeated till potassium levels are corrected
4. Hyperkalemia is a dangerous condition due to the risk of arrhythmias, muscle paralysis [3].

It is treated as follows

   a. Exogenous sources of potassium stopped
   b. Reversible causes are treated along with management of hyperkalemia
   c. Calcium is given as 10ml calcium gluconate with 10ml D5 over 2-3 minutes
   d. The insulin and glucose combination is effective in driving potassium back into the cells. 10 units of regular insulin is given in 100ml of D25.
   e. Loop and thiazide diuretics can be used in fluid-overloaded patients to enhance potassium excretion.

DISCUSSION

Delirium is a clinical syndrome characterized by impaired consciousness, cognitive function, or perception that has a fluctuating and acute onset. Delirium diagnostic tools that are often used include the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria and the Confusion Assessment Method (CAM).[4]

In this case, the diagnosis of delirium was confirmed by using the CAM criteria, where a sudden change in consciousness was found, because the patient was previously able to communicate normally. Decrease in consciousness also fluctuated throughout the day, and the patient is also unable to concentrate.

There can be 3 types of delirium: hyperactive, Hypoactive, Mixed.[2,4]

In this case, the patient had features of agitation, irrelevant talk, confusion with few episodes of drowsiness suggestive of mixed delirium.

The predisposing factors in this case were increased age, long ICU stay, decreased sensory stimulation, and subsequently, delirium was precipitated by infection and hypernatremia. Hypernatremia and several pathological conditions of the central nervous system are associated with shrinkage of brain cells and can also cause encephalopathy. Due to an increase in tonicity, water moves out of brain cells, producing shrinkage, and in a few conditions, can lead to rupture of blood vessels and subsequent hemorrhage. Hypernatremia also causes excessive thirst in the elderly, which is a source of agitation in bedridden patients. All these lead to symptoms of confusion, dizziness, lethargy, and in severe conditions, seizures.

Recent studies show that hypernatremia was associated with an increased risk of delirium after cardiac surgery. This finding has implications for risk stratification, early detection, and management of delirium in patients receiving cardiac surgery.[5]

CONCLUSION

Delirium is a neurocognitive disorder that is commonly found, especially in the elderly.[1,2,3] The characteristics of delirium are acute changes in cognition, attention, and awareness, which experts describe as brain failure.[6] This condition involves various risk factors and trigger factors.[4,5,6] Due to the varied clinical conditions, several criteria are needed to assist in the diagnosis of delirium, one of which is the CAM score often used.[4,5,6] The treatment of delirium is mainly to treat the causes of delirium and non-pharmacological therapy.[5,6] Non-pharmacological therapy is needed if the patient is restless or has the potential to harm themselves and the staff caring for the patient.[4,5,6]

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Unveiling the Hidden Adverse Effect: Carbapenem Induced Rash in a Hospitalized Patient–Need for Vigilance

Manisha Arora, Amit Prakash Singh, Nitin Bansal

INTRODUCTION

An elderly female, aged 85 years old was admitted in our hospital with complaints of high-grade fever, generalized rash all over body, decreased appetite and decreased urine output for two days.

This patient was recently discharged on request with the diagnosis of E.Coli related urosepsis with underlying Type 2 diabetes, Hypertension and CKD stage II. Patient had received Inj Meropenem for three days followed by IV Ertapenem for next four days. Her blood sugar and blood pressure had remained normal.

ER examination revealed that patient was looking toxic with a generalized rash. Scaling was noticed at a few places however oral mucosa was intact. Her vitals were normal with pulse rate 92/ minute, regular with blood pressure of 130/80 mmHg and SpO2-96% on ambient air. She was looking pale, severely dehydrated with dry mucosa and there was evidence of bilateral pedal oedema. Systemic examination was normal. Skin examination revealed generalised rash with scaling predominantly over neck and legs. Biochemistry revealed Hb 10.6gm%, TLC- 33.8 with neutrophilic predominance, CRP-126, Urea- 45, S.creatinine - 3.96mg%. She was started on IV Meropenem and Teicoplanin, IV fluids and other supportive treatment.

Dermatologist's opinion was taken and the clinical diagnosis of Acute flare up of Eczema was made. Imaging was done to evaluate for the source of sepsis. HRCT chest revealed that there was bilateral pleural effusion with thickening of right horizontal fissure. There were a few enlarged lymph nodes in the pre and para tracheal region and aortopulmonary region largest measuring 18x17 mm. CT abdomen revealed bilateral small sized kidneys with lobulated margins suggestive of medico-renal disease. Small cortical cysts were seen at the lower pole of right kidney largest of size 13mm. Right ovary showed cyst of size 3.8x3.3 cm along with the compression wedging of L1. Ca-125 was normal and MRI pelvis as advised by gynaecologist was refused by the attendants.

Patient showed improvement in the first 72 hours and inflammatory markers in the form of TLC, CRP and S creatinine started declining gradually but patient's rash was persistent with itching and scaling. From Day 4 onwards, increasing trend of CRP and Total leucocyte counts with increasing eosinophils was noted. There was no fever or development of any new symptoms or related signs for this increase in inflammatory markers. ID consultant's opinion

Figure 1. Maculopapular rash on the back following the usage of Meropenem

Figure 2: Fading of rash 24 hours after stopping Meropenem

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was taken and a possibility of Beta lactam (Carbapenem) induced rash with a possibility of DRESS syndrome was kept. Although she didn't qualify all the criteria of DRESS syndrome yet it being the Carbapenem rash could not be denied. Injection Meropenem was stopped and over 48 hours, her rash started fainting with improvement in biochemical parameters.

She was kept under close follow up and within two weeks, all her biochemical parameters settled, and rash completely disappeared confirming it to be CARBAPENEM INDUCED RASH.

DISCUSSION

Carbapenem antibiotics are the members of the beta-lactam class having a beta lactam ring with a modified thiazolidine ring, thus theoretically making them prone to cause hypersensitivity reactions. These agents are extremely crucial in the management of various infectious diseases. They possess the broadest spectrum of activity serving as highly potent agents against both gram positive and gram-negative bacteria including anaerobic bacteria. The overall reported incidence of carbapenem allergy is 0.3-3.7% (1). The most of these allergic reactions are type IV delayed hypersensitivity reactions which present as a maculopapular rash (2). Most patients experiencing maculopapular exanthem are thought to be harbouring circulating specific T cells that become activated in skin when exposed to a drug and induce this rash via release of pro inflammatory cytokines and cytotoxicity. Rash can also emerge due to nonspecific activation of innate immunity by proinflammatory properties of drugs themselves.

Since only a few published data on carbapenem-induced allergic reactions exists in the literature, this article is a reminder to clinicians for being extra vigilant while starting Carbapenem with respect to this uncommon adverse reaction and need to switch to an alternating drug.

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