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Dietary Modification in an Outpatient with Intracerebral Hemorrhage and Hypertension : A Case Study

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ABSTRACT

Intracerebral hemorrhage (ICH) with hypertension requires comprehensive medical management and appropriate nutritional care. This case study aimed to describe the implementation of a low-salt diet in an outpatient with ICH and hypertension over seven days. A 45-year-old man with subcortical ICH and a history of hypertension received an oral Low Salt III diet providing approximately 1,900 kcal/day, nutrition counselling, and daily dietary monitoring. His baseline body mass index (BMI) was 22.99 kg/m². He continued taking prescribed antihypertensive medication. At follow-up, systolic blood pressure decreased, while diastolic pressure remained unchanged. Initial symptoms, including weakness, headache, and slurred speech, were no longer reported. Total cholesterol and triglyceride levels also decreased. Mean daily energy intake was 1,634 kcal (87.8% of requirements), protein intake was 73.0 g (106.1%), and estimated sodium intake was 372.7 mg. However, sodium intake should be interpreted cautiously due to incomplete dietary records. In this case, the low-salt diet was accompanied by a reduction in systolic blood pressure and improvement in reported symptoms. However, these changes cannot be attributed to dietary intervention alone because of concurrent medication, clinical recovery, and possible measurement variability.

Keyword : Dietary modification; intracerebral hemorrhage; low salt diet; hypertension; outpatient care

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INTRODUCTION

Stroke remains a major cause of death and disability worldwide. Global Burden of Disease 2021 estimates indicate approximately 11.9 million incident strokes in 2021; intracerebral hemorrhage (ICH) accounted for about 28.8% of incident strokes [1]. A World Stroke Organization ICH factsheet based on GBD 2021 estimates more than 3.4 million new ICH cases globally each year [2].

In Indonesia, the 2023 Indonesian Health Survey (Survei Kesehatan Indonesia/SKI) reported physician-diagnosed stroke prevalence of 8.3 per 1,000 population aged 15 years or older. In East Java, the corresponding prevalence was 9.0 per 1,000 [3]. SKI 2023 reported hypertension based on measured blood pressure in 29.2% of people aged 15 years or older, while prevalence based on physician diagnosis

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was 8.0% [4]. These measures use different operational definitions and should not be conflated. The SKI report provides provincial estimates; a Tuban-specific ICH or stroke prevalence estimate was not available in the source material.

Hypertension is a major modifiable risk factor for spontaneous ICH and recurrent vascular events. Chronic hypertension can contribute to small-vessel arteriopathy and vessel rupture, although the cause of an individual patient's ICH must be established clinically. The 2022 American Heart Association/American Stroke Association (AHA/ASA) guideline recommends blood-pressure control for long-term management after spontaneous ICH and supports healthy lifestyle measures as part of risk-factor management [5]. The available case record documents a history of hypertension but does not establish secondary hypertension or identify a secondary cause; therefore, this report uses the term hypertension without the modifier secondary.

Dietary sodium reduction is supported by evidence from hypertension populations. In the randomized DASH-Sodium feeding trial, both the DASH dietary pattern and lower sodium intake reduced blood pressure compared with a control dietary pattern and higher sodium intake [6]. A systematic review and meta-analysis of randomized trials also found that longer-term modest salt reduction lowers blood pressure in people with and without hypertension [7]. These studies were not designed specifically to evaluate a seven-day low-salt intervention in an outpatient recovering from ICH; they provide a rationale for dietary counselling rather than direct proof of benefit in this case.

Nutrition care after stroke must address nutritional adequacy and swallowing safety. The ESPEN guideline on clinical nutrition in neurology emphasizes nutritional screening and assessment of dysphagia in neurological patients, with route and texture adapted to swallowing function [8]. A healthy dietary pattern emphasizing vegetables, fruits, whole grains, and reduced sodium and saturated fat is consistent with broader cardiovascular prevention evidence [5,9]. Direct reports of outpatient sodium-restricted diet implementation after ICH in Indonesian clinical practice remain limited.

The objective of this case report was to describe implementation of a Low Salt III diet with nutrition counselling in one outpatient with ICH and hypertension and document clinical, biochemical, anthropometric, and dietary changes observed during seven days of monitoring. This report does not seek to establish treatment efficacy or causality.

METHODS

This descriptive single-case report examined nutrition care provided in June 2026 in the outpatient/home-care context associated with dr. R. Koesma Regional Public Hospital, Tuban Regency, Indonesia, using the Nutrition Care Process (NCP) framework. The purposively selected patient was a 45-year-old man (Tn. K), diagnosed with subcortical hemispheric intracerebral hemorrhage (ICH) and hypertension, with a history of routine antihypertensive medication use; however, the medication details

were unavailable. Clinical and biochemical data were obtained from patient assessments and medical records, while dietary information was collected through a 24-hour recall and qualitative food-frequency questionnaire (FFQ). Baseline anthropometric measurements included body weight of 70.0 kg, estimated height of 174.5 cm, BMI of 22.99 kg/m², ideal body weight of 67.05 kg, and MUAC of 33.5 cm (104.04%). Baseline biochemical values were total cholesterol 172 mg/dL, triglycerides 172 mg/dL, HDL 41 mg/dL, and LDL 116 mg/dL. Clinical findings included compos mentis consciousness, GCS 15, weakness, headache, and slurred speech. No standardized swallowing assessment or additional laboratory parameters were reported. The prescribed intervention was an oral Low Salt III soft-textured diet of approximately 1,900 kcal/day, based on an estimated requirement of 1,861.31 kcal/day, with 15% protein (68.8 g), 25% fat (51.7 g), and 60% carbohydrate (279.2 g). The dietary plan targeted sodium intake of 1,000–1,200 mg/day, whereas monitoring used a limit of less than 1,500 mg/day; this discrepancy requires verification. Nutrition education was delivered to the patient and family through counselling, discussions, leaflets, and portion-size demonstrations for approximately 20–30 minutes.

Monitoring over seven days included daily energy, macronutrient, and sodium intake, anthropometry, clinical symptoms, blood pressure, lipid parameters, and dietary compliance. Body weight increased to 70.5 kg and BMI to 23.15 kg/m². Blood pressure decreased from 140/80 to 120/80 mmHg, although only one measurement at each time point was documented. Total cholesterol and triglyceride values were assessed before and after intervention, but post-intervention HDL and LDL values and laboratory measurement details were unavailable. Dietary compliance was evaluated using a 15-point questionnaire, with a final score of 14/15, categorized as very good; however, instrument validation and scoring criteria were not reported. Ethical approval was obtained from the Health Research Ethics Institute of the Institute of Health Sciences Nahdlatul Ulama Tuban (No. 398/0084223523/LEPK.IIKNU/VI/2026; 19 June 2026). Written informed consent was signed on 29 June 2026 for academic and research purposes; however, explicit consent for journal publication and separate institutional authorization from the hospital were not identified and require confirmation before submission.

RESULT

Table 1. Baseline Clinical and Anthropometric Characteristics of the Patient

Characteristic	Baseline information
Age/sex	45 years/male
Diagnosis	ICH involving subcortical hemisphere + hypertension
History	Previous hypertension; father had hypertension
Medication	Routine physician-prescribed antihypertensive medication reported; name/dose unavailable
Consciousness	Compos mentis; GCS 15 (E4V5M6)
Symptoms	Weakness, headache, slurred speech
Weight/estimated height	70.0 kg / 174.5 cm
BMI	22.99 kg/m²
MUAC	33.5 cm; 104.04% reference

Characteristic	Baseline information
Lipid profile	TC 172; TG 172; HDL 41; LDL 116 mg/dL
Other laboratory tests	Glucose, HbA1c, urea, creatinine, sodium, potassium not reported

Baseline 24-hour recall showed energy intake 1,292.7 kcal (69.45% of requirement), protein 46.8 g (68.02%), fat 61.0 g (117.99%), and carbohydrate 143.1 g (51.25%). The FFQ described frequent intake of rice, tempeh, cooking oil, and selected animal and plant foods. The patient reported no food allergy or food prohibition.

Table 2. Changes in Physical Symptoms, Anthropometric Measurements, and Blood Pressure After Seven Days of Dietary Intervention

Parameter	Before	After 7 days	Changes/interpretation
Anthropometric Measurements			
Weight	70 kg	70.5 kg	+0.5 kg
BMI	22.99 kg/m²	23.15 kg/m²	Both within normal adult BMI range
Weakness	Positive (+)	Negative (-)	Assessment method not specified
Headache	Positive (+)	Negative (-)	Assessment method not specified
Slurred Speech	Positive (+)	Negative (-)	Assessment method not specified
Clinical Indicators			
Systolic Blood Pressure (mmHg)	140	120	Recorded decrease of 20 mmHg
Diastolic Blood Pressure (mmHg)	80	80	No recorded change Resolved

The source report records weakness, headache, and slurred speech as absent at follow-up. Because no standardized symptom scale or assessor procedure was described, these are reported as documented clinical observations. Systolic blood pressure decreased in the recorded pre/post measurements, whereas diastolic pressure was unchanged. The findings do not justify describing blood pressure as normalized.

Table 3. Comparison of Biochemical Parameters Before and After Dietary Intervention

Indicator	Before	After	Interpretation
Total Cholesterol (mg/dL)	172	156	Lower post-intervention value Lower
Triglycerides (mg/dL)	172	141	post-intervention value
HDL Cholesterol (mg/dL)	41	Not reported	No pre/post comparison
LDL Cholesterol (mg/dL)	116	Not reported	No pre/post comparison

Table 3. Biochemical Parameters Before and After Intervention. Post-intervention HDL and LDL were unavailable. LDL treatment targets depend on cardiovascular-risk category; the baseline value should be interpreted against the applicable PERKENI guideline and the patient's documented risk classification [9].

Table 4. Daily Nutrient Intake During the Seven-Day Dietary Intervention

Day	Energy (kcal)	Protein (g)	Fat (g)	Carbohydrate (g)	Sodium (mg)
Day 1	1615	72	45	233	386.7
Day 2	1655	75	43	231	372.1
Day 3	1625	72	43	233	361.5
Day 4	1621	72	45	232	371.8
Day 5	1625	72	41	238	379.3
Day 6	1632	73	43	245	367.9
Day 7	1665	76	44	248	369.4
Mean	1634	73.1	43.4	237.1	372.7
SD (sample)	18.7	1.7	1.4	6.8	8.2

Mean energy intake was 1,634.0 kcal/day (87.8% of 1,861.31 kcal), protein 73.0 g/day (106.1% of 68.8 g), fat 43.4 g/day (83.9% of 51.7 g), and carbohydrate 237.1 g/day (84.9% of 279.2 g). Estimated sodium intake averaged 372.7 mg/day, substantially below the monitoring limit of 1,500 mg/day. This unusually low estimate requires checking against original food records, particularly the inclusion of cooking salt, sauces, seasonings, and processed foods.

The overall dietary compliance score was 14/15 and was categorized as very good in the source report. Daily compliance scores were not available and are therefore not distributed across individual days.

Tabel 5. Comparison of Baseline and Intervention Nutrient Intake

Nutrient	Baseline 24-h recall	Intervention mean	Target/limit
Energy	1,292.7 kcal	1,634.0 kcal	1,861.31 kcal
Protein	46.8 g	73.0 g	68.8 g
Fat	61.0 g	43.4 g	51.7 g
Carbohydrate	143.1 g	237.1 g	279.2 g
Sodium	Not quantified	372.7 mg	<1,500 mg/day
Fibre	Not reported	15.1 g	15.0 g case target
Potassium/ cholesterol/ saturated fat	Not reported	Not reported	Not specified

Table 5 shows an improvement in nutrient intake during the intervention compared with the baseline 24-hour recall. Energy intake increased but remained below the calculated target, while protein intake increased and exceeded the target. Fat intake decreased, whereas carbohydrate intake increased but remained below the target. Fibre intake met the case-specific target. Sodium intake was below the recommended limit, although the estimated value requires verification. Potassium, cholesterol, and saturated fat intake could not be evaluated because data were unavailable. Overall, the findings indicate improved dietary intake during the intervention, particularly in energy, protein, and carbohydrate consumption, although the energy and carbohydrate targets had not yet been achieved.

DISCUSSION

This case describes implementation of an oral Low Salt III diet with individualized nutrition education in an outpatient with ICH and a history of hypertension. The main observations were a lower recorded systolic blood pressure, unchanged diastolic pressure, symptoms recorded as absent at follow-up, lower post-intervention total cholesterol and triglycerides, and improved average energy and protein intake compared with baseline recall. These observations describe changes over time and do not demonstrate that the dietary intervention caused them.

The direction of the systolic blood-pressure change is compatible with evidence that reducing sodium intake and following a DASH-type dietary pattern can lower blood pressure. The DASH-Sodium trial demonstrated lower systolic pressure with reduced sodium and with the DASH dietary pattern [6]. A meta-analysis of randomized trials likewise reported blood-pressure reductions with longer-term salt reduction [7]. Those studies used controlled interventions and longer observation periods; the present case involved one patient and seven days of monitoring. AHA/ASA guidance supports long-term blood-pressure management after spontaneous ICH, but evidence for specific dietary interventions in ICH survivors is less direct than evidence in general hypertension populations [5].

The blood-pressure change must be interpreted in the context of concurrent antihypertensive treatment. The patient reported routine use of physician-prescribed medication, but drug, dose, timing, and adherence were not recorded. Natural recovery after ICH, regression to the mean, measurement variability, differences in measurement conditions, and observation-related effects may also have influenced the readings. A baseline value of 140/80 mmHg is a single measurement and cannot establish usual blood pressure. The unchanged diastolic value supports reporting a systolic decrease rather than normalization.

The reported absence of weakness, headache, and slurred speech is a descriptive clinical observation. Symptom assessment was not standardized, and neurological recovery after ICH can occur independently of dietary changes. Slurred speech does not by itself establish dysphagia, but should prompt documentation of swallowing and chewing safety. ESPEN guidance recommends nutritional and dysphagia assessment in neurological patients [8]. In this case, the diet was soft and oral, but a validated swallowing screen was not documented.

Mean energy intake remained below the calculated requirement, although it was higher than the baseline recall. Protein intake exceeded the calculated target; renal safety cannot be discussed because urea and creatinine were unavailable. The sodium estimate of approximately 373 mg/day is unusually low for a complete daily intake and may reflect under-recording or omission of discretionary salt and seasonings. It should not be interpreted as confirmed sodium exposure without a transparent calculation method or objective assessment such as 24-hour urinary sodium.

- Total cholesterol and triglycerides were lower in the post-intervention record, but causation cannot be assigned to diet. Fasting status, assay method, laboratory, lipid-lowering medication status, saturated-fat intake, dietary cholesterol, and added-sugar intake were not documented. Total-fat adequacy of approximately 84% does not establish saturated-fat restriction. Post-intervention HDL and LDL were unavailable; consequently, no conclusion can be made about changes in these fractions. Dyslipidemia management should be interpreted using cardiovascular-risk category and guideline-based LDL targets [9].

The compliance score of 14/15 was categorized as very good in the source report. However, questionnaire source, items, scoring, and validation were not provided, so the score should be treated as a locally recorded measure rather than a validated adherence scale. Family education and leaflet use were described, but their independent effects on adherence were not measured. Dietitians should pair an individualized, feasible plan with review of energy adequacy, sodium-recording completeness, medication use, swallowing safety, and blood pressure.

LIMITATIONS

This report concerns one patient and a seven-day observation period, without a control group or longer-term follow-up. Concurrent antihypertensive medication and natural neurological recovery may have contributed to observed changes. Dietary intake was self-reported and no objective sodium biomarker was obtained. The sodium estimate was unusually low and requires verification. Blood-pressure device and measurement protocol were not documented, and only pre/post values were available rather than daily readings. Symptom assessment and the compliance questionnaire were insufficiently described. Post-intervention HDL and LDL, glucose, HbA1c, renal function, sodium, and potassium were unavailable. These limitations preclude causal inference and restrict generalizability.

CONCLUSION

In this single outpatient case, implementation of a Low Salt III diet with nutrition education and seven-day monitoring was feasible and was accompanied by a lower recorded systolic blood pressure, reported improvement in symptoms, and lower post-intervention total cholesterol and triglyceride values. The observations do not establish that the diet alone caused these changes, particularly because the patient was also using prescribed antihypertensive medication and the monitoring period was short. Future studies should include longer follow-up, larger case se ries or controlled designs, objective sodium assessment where feasible, explicit documentation of medication and swallowing status, and repeated assessment of dietary adherence beyond the first week.

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