

Processed Food and Kidney Diseases – A Growing Threat in Bangladesh

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Bangladesh is currently experiencing a rapid nutrition transition: the staple grain, legume, and vegetable-based traditional diets are being eschewed for ready-to-eat ultra-processed foods as a function of urbanization and increased incomes. 8% annual growth in the country's processed-food sector (worth \$2.2 billion in 2020) demonstrates this dietary change.¹ Now a days, processed snacks, instant noodles, beverages and fast foods often high in salt, sugars, saturated fats and industrial additives are now widely available.² Such dietary changes consequently promotes the burden of malnutrition with increasing rates of overweight and obesity among adults and children. High intake of salt from packaged & processed food has already been noted as contributor to childhood hypertension which is a key precursor to kidney damage.³ These evolving food transition and rising non communicable diseases (NCD) burden put a risk for increasing chronic kidney disease (CKD) in Bangladesh.

How Processed Diets Can Lead to CKD

Consumption of processed and ultra-processed food promotes CKD through multiple physiologic pathways. Salt (sodium) intake through packaged snacks and instant foods raises the condition of hypertension which directly put stressing on the kidneys. Renal hemodynamics are altered by high sodium intakes which increase oxidative stress and induce glomerular hypertension and fibrosis even in animal models.⁴ Sweetened beverages and snacks contains added sugars, and refined carbohydrates which promote obesity and insulin resistance, the primary mediators of type 2 diabetes. Similarly diets high in saturated and trans fat intake from processed

meats, fried foods, baked goods promotes obesity, arteriosclerosis, dyslipidemia which all are risk factors playing roles driving pathogenesis toward progression of chronic kidney diseases.

Advanced glycation end-products (AGEs) produced during food processing with high heat (e.g. frying, baking) and accumulate in tissues when intake. The kidneys usually help clear AGEs (advanced glycation end-products) from the body, but long-term exposure can trigger inflammation and oxidative damage in kidney tissue.⁵ Research has found that a single meal high in AGEs, like fried processed meat, can rapidly increase renal blood flow and oxygen demand, pointing to potential early stress on the glomeruli.⁶ Many additives in processed foods poses a direct hazard to kidney health. Additives-containing phosphorus (common as emulsifiers or preservatives) and potassium salts can easily make the condition known as hyperphosphatemia and hyperkalemia in susceptible individuals.⁷ Chronic overload of phosphorus accelerates both calcification of the kidneys and damage to the cardiovascular system while dietary potassium precipitates potentially deadly cardiac arrhythmias in patients with renal impairment. Other additives, such as nitrates/nitrites, titanium dioxide, bisphenol packaging etc. have been linked with gut dysbiosis, systemic inflammation, and resultant vascular endothelial dysfunction are possible exacerbators of CKD.¹ In brief, high energy density together with salt/sugar content & unhealthy

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fats faster the progression of CKD.

Epidemiological Trends: CKD and Dietary Patterns

CKD is one of the major public health issues in Bangladesh. Several research revealed that 16–22% of individuals have albuminuria or reduced eGFR, both of which are markers of chronic kidney disease.⁸ In Bangladesh, patients suffering from Chronic Kidney Disease (CKD) are often diagnosed in the advanced stages of the illness which creating an increased need for renal transplants and dialysis. Some researchers estimate the CKD prevalence to range between 6-18%, of them 11% being in stage III-V.⁸ Each year roughly 200 and 250 per million people in Bangladesh being diagnosed with end-stage kidney failure (ESKF) requiring dialysis.⁸

The risk of CKD and other NCDs trends increased with frequently consumption of processed food. Various research and market analyses indicate that processed foods now contribute a remarkable share of calories. Snacks (chips, fried legumes), instant noodles and sweets as the most commonly consumed packaged foods.¹ A study in 2023 found that nearly 50% of sampled adolescents eat “junk food” more than three times per week.⁹ This frequent consumption by young people may face a lifetime potential metabolic danger. Several reports indicate a rise in overweight/obesity rates (25–32% of adult women currently overweight or obese) and micronutrient deficiencies which is the marker of this nutritional transition in our country.¹⁰

Public Health Implications and Vulnerable Groups

Now a days, peoples in rural areas often lack access to early CKD screening and specialty care, so disease are diagnosed in the advanced stages.

Besides this, poor urban families generally rely on cheap local herbal treatment. Childhood diets are already changing: 29% of urban children reportedly consume instant noodles at least three times a week which is very alarming.³ Early-life excess salt exposure is known to “program” higher blood pressure and kidney damage in adulthood. Thus children growing up on these diets are at risk for future CKD. The economic impact is also need to put under consideration. Dialysis and transplant services remain scarce and costly. Most CKD patients can’t afford the medical cost, and government subsidies are minimal. For a poor family, a CKD diagnosis and treatment cost all of their savings and push them into poverty.

Policy and Clinical Recommendations

- **Food labeling and marketing laws:** Policymakers should enforce food safety act and mandate about front-of-pack (FOP) warnings labels or warning icons for high salt/sugar/fat contents in processed food, as recommended by global best practices.
- **Promoting nutrition education:** Public health campaigns and counseling must emphasize the harms of processed foods. Schools, community programs and healthcare professionals should teach the consequence of excessive salt, sugar and unhealthy fats intake and kidney health. Health workers can integrate simple dietary screening into routine NCD care (e.g. in hypertension or diabetes clinics). The latest KDIGO guidelines for CKD (2024) recommend plant-based diets and explicitly advise reducing ultra-processed food intake in kidney patients.⁷ Bangladesh’s clinical practice can align with these guidelines by involving nutritionists in CKD

management teams and training physicians to counsel on diet.

- **Target high-risk groups:** Special efforts are needed for vulnerable populations by rural clinics should educate about salt reduction; maternal health programs should address the burden of malnutrition; school curriculums should promote healthy eating.¹⁰

Processed food consumption in Bangladesh is not only a dietary concern but also it is a public health emergency. As CKD grows silently and poses a significant threat to millions of people, especially the youth and urban poor, urgent attention must be given to reforming labeling laws, expanding nutrition education, and integrating diet-focused screening into CKD prevention.

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