ECONOMIC BURDEN OF HYPERKALEMIA IN TURKIYE

EE280

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OBJECTIVES

There is no data about the cost of hyperkalemia management in Turkiye. The aim of this study was to estimate the economic burden of hyperkalemia in Turkiye.

METHODS

Hyperkalemia economic burden was determined by "cost of illness methodology". After calculating direct and indirect costs, weight in frequency, and determining the annual costs per patient, the total cost is reached on the basis of the indicated prevalence. An expert panel has been organized for the use of health resources. Direct costs were calculated annually from a reimbursement agency perspective, taking into account the resource usage, frequency, and usage rates. For the direct costs, patients' applications to hospital yearly, laboratory and imaging tests implemented during admission, hospitalizations and treatments, medicine costs, side effects and complications are evaluated. Indirect costs that belong to patients and proxies such as productivity loss were also calculated. Patients' absenteeism due to illness, sickness reports, and absenteeism due to treatment as well as transportation costs and out-of-pocket payments were also calculated under indirect costs. Premature death cost was included as an effective parameter. Data for indirect costs were obtained from the expert panel. US dollar was used as currency (1$ = 13 TL).

RESULTS

It was calculated by the expert panel based on the experience and available literature that 15% of the patients visit emergency department at least four times per annum while the 56.18% visit internal diseases department twice, 43.82% visit nephrology department twice, 65% visit cardiology department once, 100% visit cardiovascular surgery once, 26% visit endocrinology twice, 20% visit family physician outpatient clinic twice a year.

As laboratory and imaging tests, fasting blood sugar, creatinine, eGFR, HbA_{1C}, microproteinuria (End Stage Renal Failure Stage 5), cholesterol, triglyceride, HDL, leukocyte, hemoglobin, thrombocyte and ECG six times annually for all patients.

Table 1 Medical Treatment for Hyperkalemia Patients

Emergency Unit 10%		
Treatment	%	Frequency
Calcium Gluconate	28	1
Tamponize	100	1
Salbutamol	70	1
Bicarbonate	13	1
Dialysis	25	1
Diuretic	80	1
Insulin+Dextrose Infusion	30	1
Outpatient 50%		
Treatment	%	Frequency
Diet	100	1
Calcium Polysterene Sulfanate	30	1
Bicarbonate	20	1
Diuretic	90	1
Inpatient 90%		
Insulin+Dextrose Infusion	90	3
Calcium	15	3
Sabutamol	70	3
Diuretic	75	3
Dialysis	10	3
Polysterene Sulfanate Calcium	25	3
Diet	100	1
Chronic Case		
Diuretic	85	1
Diet	100	1
Polysterene Sulfanate Calcium	25	1
Bicarbonate	25	1

Again 100% patient should get potasium, uric acide, microproteinuria (Chronic Renal Disease Stage 4) , 4 times per annum and only 5% of them get ECHO ones annually.

90% of patient needs to be hospitalized average 3 days in a year and 10% of them monitorized in emergency department and 1% of them is hospitalized in intensive care unit.

As stated in the treatment protocols, the treatment varies patient to patient as expected. The treatment status are shown above (Table 1). Annual usage rates were determined in the expert panel. In hyperkalemia patients, adverse events and comorbid diseases are included in the costs.

The adverse events of treatment ; bradycardia (16%), symptomatic hypoglycemia (88.5%), constipation (5%), vascular calcification (5%), vomiting / anemia (3%), gastroenteritis (13%), headache (%1) were costed. Comorbid disease of patients with hyperkalemia; 14% chronic renal failure, 13% heart failure, 34% hypertension, 23% diabetes mellitus, %49 coronary artery disease were calculated too.

Table 2 Annual Direct Non-Medical Costs and Indirect Cost Per Patient

Direct Non-Medical Costs (Average per patient / Yearly)	$
Out-of-Pocket Healthcare Expense	5.37
Transportation	23.35
Indirect Costs (Annual) (Average per patient)	**$**
Working Days Lost Due to Leave and Report	104.27
Care Giver Cost	165.12
Proxy Cost	12.84
Early Dead Cost	1594.14

Direct disease cost per patient was determined on an annual basis.

Accordingly, the average outpatient and test cost per patient per year is $34.8, hospitalization cost is $45.2, the drug cost is $138.9 and adverse effect cost is $38, the comorbid disease cost is $658.8 and the average annual direct & indirect medical costs per patient is $944.5. Non medical cost includes transportation cost and out of pocket cost; respectively.

Considering total number of hyperkalemia patients as 22,822 , total direct cost is determined as $21,555,893.88 from the payer perspective.

According to the expert panel opinion, approximately 4% of patients got sick days report as 5 days in a year, all patients lost their work times for treatment in hospital as 8 days in a year. In order to calculate production losses, the official minimum income for 2021 was accepted as the base wage. In addition, 10% of patients need Proxy and 5% of them needs professional care. That's why we calculated Proxy's work day lost and professional caregiver salary per year. The total cost of working days lost due to leave and report is $104.27, Proxy's cost is $12.84 and caregiver cost is $165.12 and early dead cost is $1594.14 per patient (Table2). Total direct and indirect cost is $2,820.9 per patient annually.

Hence, total indirect cost is calculated as $42,822,920.78 resulting in a total hyperkalemia cost for Turkey as $64,379,022.50 including direct costs (Table 3).

Table 3 Annual Economic Burden of The Disease

Total treated patient size	**22,822**
Total Direct cost of patient / per year	$ 21,555,893.9
Total Indirect cost of patient/per year	$ 42,822,920.8
Total economic burden of disease annually	**$64,379,022.5**

*Totals may differ due to roundings

CONCLUSIONS

Hyperkalemia had an estimated prevalence of 0,035%. The economic burden of hyperkalemia is very high for Turkey despite the low prevalence.

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