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Impact of SGLT2 Inhibitors on the Cost-Effectiveness of Population-Based Screening for Chronic Kidney Disease

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Objectives : Sodium-glucose cotransporter-2 inhibitors (SGLT2i) have been recommended by the latest Kidney Disease: Improving Global Outcomes guidelines for the treatment of chronic kidney disease (CKD), regardless of diabetic status, due to their efficacy in improving CKD and cardiovascular disease (CVD) outcomes and reducing mortality. Adding SGLT2i to standard treatment may alter the balance between costs and effectiveness associated with population-based CKD screening. However, evidence on the cost-effectiveness of population-based CKD screening incorporating treatment with SGLT2i is limited, especially in Asian countries.
Methods : A validated microsimulation model of CKD was developed to estimate the lifetime costs and health consequences from a societal perspective. A cohort of Chinese population aged 45 years was simulated based on various data sources. Main outcomes included incremental cost-effectiveness ratios (ICERs) and the averted number of cases with kidney failure with replacement therapy (KFRT) and CVD by screening compared with usual care. CKD screening with different frequencies and for different age groups in the general population was assessed.
Results : With SGLT2i added to standard treatment, annual CKD screening starting at age 45 was the most cost-effective strategy, with an ICER of $10,030 per quality-adjusted life year (QALY), yielding a reduction of $560 per QALY compared with the same screening strategy without SGLT2i treatment. Other screening strategies were also cost-effective, as their ICERs were less than three times gross domestic product per capita in China. Annual screening starting at age 45 incorporating SGLT2i treatment was estimated to avert lifetime KFRT and CVD cases by 2.76 and 35.58 per 1,000 individuals, with an additional reduction of 0.88 KFRT cases and 0.51 CVD cases per 1,000 individuals compared with screening without SGLT2i treatment.
Conclusions : Population-based screening for CKD is cost-effective and reduces the incidence of KFRT and CVD. The addition of SGLT2i to standard treatment enhances both the effectiveness and cost-effectiveness of CKD screening.

Figure1.jpg

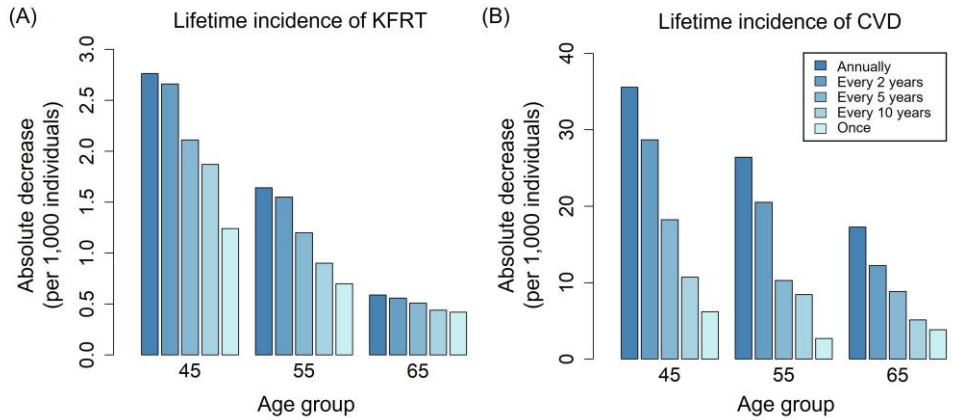

Figure1.jpg

	Lifetime incidence (per 1,000 individuals)				QALYs	Incremental QALYs	Costs, $	Incremental costs, $	ICERs, $
	KFRT cases	KFRT cases averted	CVD cases	CVD cases averted					
Base case value									
Usual care with SGLT2i	6.86		428.28		21.736		7823		
Screening once with SGLT2i	5.62	1.24	422.07	6.21	21.782	0.046	8486	663	14416
Screening every 10 years with SGLT2i	4.99	1.87	417.56	10.72	21.847	0.111	9068	1245	11225
Screening every 5 years with SGLT2i	4.75	2.11	410.04	18.24	21.852	0.116	9426	1603	13759
Screening every 2 years with SGLT2i	4.20	2.66	399.59	28.69	21.911	0.175	9927	2104	12009
Screening annually with SGLT2i	4.10	2.76	392.70	35.58	21.958	0.223	10057	2234	10030
Difference compared with corresponding strategies without SGLT2i treatment									
Usual care with SGLT2i	-3.68		-1.37		0.092		289		
Screening once with SGLT2i	-4.34	0.66	-3.93	2.56	0.100	0.008	232	-57	-4569
Screening every 10 years with SGLT2i	-4.47	0.79	-3.57	2.20	0.120	0.029	253	-36	-4321
Screening every 5 years with SGLT2i	-4.41	0.73	-3.30	1.93	0.096	0.005	196	-93	-1405
Screening every 2 years with SGLT2i	-4.69	1.01	-1.69	0.32	0.098	0.006	287	-2	-447
Screening annually with SGLT2i	-4.56	0.88	-1.88	0.51	0.101	0.010	267	-22	-560

Abbreviations: SGLT2i, sodium-glucose cotransporter-2 inhibitors; KFRT, kidney failure with replacement therapy; CVD, cardiovascular disease; QALY, quality-adjusted life year; ICER, incremental cost-effectiveness ratio.

All screening strategies were compared with usual care.