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231, de Saram Place, Colombo 01000, Sri Lanka
Tele: + 94 11 2695112, Fax: +94 11 2696583, E mail: epidunit@sltnet.lk
Epidemiologist: +94 11 2681548, E mail: chepid@sltnet.lk
Web: http://www.epid.gov.lk

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Chronic Kidney Disease - A Global Public Health Problem

Chronic Kidney Disease is increasingly recognized as a worldwide public health problem for many reasons. It causes premature morbidity and mortality and lowers quality of life. Further, it places a large burden on patients, their families, society and the health system, a burden that is getting larger despite existing control efforts. A broad and coordinated public health approach is necessary to meet the burgeoning health, economic and societal challenges of chronic kidney disease, in addition to the clinical approaches to controlling it.

During the past three decades, the incidence and prevalence of chronic kidney disease (CKD) and end stage renal disease (ESRD), the form of CKD in which life can be sustained only by dialysis or transplantation, have risen progressively. In the US, 9.6% of adults are estimated to have CKD. Studies from Europe, Australia and Asia also confirm high prevalence of CKD. As a result, physicians, researchers and public health officials across the world now put more effort to study in detail the antecedents and outcomes of CKD, determine risk factors for its development and progression, and develop strategies for its detection, evaluation and treatment.

The explosion in the number of people with CKD has enormous economic implications. As the treatment modalities are expensive, patients with ESRD consume a disproportionate share of health care resources. This is well reflected by the fact that the incidence of patients with ESRD being treated by renal replacement therapy is high in affluent countries. However, if the present trend continues, treatment of ever-increasing burden of ESRD cannot be afforded, even in the wealthiest of countries.
The world's disease profile is changing, and chronic diseases now account for the majority of global morbidity and mortality, rather than infectious diseases. This change is reflected in the type of disease causing chronic kidney disease and in their presentation and progression. Today, the major cause of CKD is diabetes as a result of the global pandemic of type 2 diabetes.

In United States, 44% of all incident patients with ESRD are diabetic, while glomerulonephritis, cystic kidney disease and hypertension have remained relatively steady as causes of ESRD over the past decade. In Australia, incidence of ESRD due to diabetes is 25%, and in the European Registry Data number of diabetes entering ESRD treatment programme is between 15%-33%, while the numbers entering due to glomerulonephritis are 7%-20%. Countries throughout Asia also have large percentages of incident ESRD patients due to diabetes: Hong Kong 38%, Pakistan 42%, Taiwan 35%, Philippines 25% and Japan 37%.

The rate of increase in the prevalence of diabetes is extraordinary and this will lead to a corresponding increase in the number of patients with CKD. The global projection by the International Diabetes Federation predicts that the number of diabetics in the world will rise from 189 million today to 224 million in the year 2025, an increase of 72%. By region, over the next quarter of a century, an increase of 88% in South America, 59% in North America, 18% in Europe, 98% in Africa, 97% in the Middle East and 91% in Asia has been predicted. The additional burden of progressive CKD due to the diabetes pandemic will constitute one of the greatest medical challenges of the 21st century. The clinical manifestations and course of CKD depend on the cause and type, severity, rate of

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progression and co-morbid conditions. Outcomes of CKD include not only progression to ESRD but also increased risk of cardiovascular disease (CVD). Patients with CKD are far more likely to die, principally from CVD, than to develop kidney failure. Approximately 30% of patients with diabetic nephropathy eventually progress to ESRD and the rest usually die from cardiovascular disease before reaching end stage.

Prevention of CKD

There is requisite knowledge to prevent or at least delay its onset, its progression, and the co-morbidities that accompany it. Translating these advances to simple and applicable public health measures must be adopted worldwide. Although, there is still much to learn about the impact of treatments and their optimal combinations, it is not too early to begin implementation.

A key will be the early identification of individuals who are at risk. However, unfortunately, CKD is commonly "underdiagnosed" and/or "under-treated", resulting in lost opportunities for prevention. Many patients with CKD continue to receive suboptimal care. The reasons for this suboptimal care are complex, but people at risk because of diabetes or hypertension are often unaware that CKD can be caused by these conditions. Further, most individuals with CKD are unaware that they have this disorder.

Current preventive care practices include maintaining stringent control of blood pressure to a target of 130/80 mm Hg, using angiotensin-converting enzyme inhibitors(ACEIs) and angiotensin II receptor blockers (ARBs) in both diabetic and non-diabetic nephropathies, maintaining careful glycaemic control in individuals with diabetes, and following a low-protein diet. Additional reports indicate that treating dyslipidaemia, losing weight, quitting smoking, and managing anemia may also help to delay progression of early CKD.

The Way Forward

The issue of CKD extends beyond a clinical problem addressed only by health care providers to a major public health issue requiring multilevel efforts. There is a great challenge to communicate the magnitude of CKD problem to governments worldwide, in order to influence global and national health policy and decision makers. Initiatives should be undertaken to make the general population more aware of the seriousness of CKD, its risk factors, and opportunities for screening. People identified with CKD should be provided appropriate educational materials to explain the treatment regimens and the benefits of undertaking therapy. Access to high-quality care should be ensured.

Public health policies for CKD must be coordinated with existing policies for non-communicable diseases as it is common in people with other chronic diseases and multiplies the risk for adverse outcomes and costs. Currently few countries have policies for CKD and most are unaware of the high prevalence of CKD, its contribution to other diseases, or its economic burden. Prevention, early detection and intervention are the more cost effective strategies for CKD.

Governments should support programmes for screening and surveillance of CKD. These activities would document the prevalence, incidence, outcomes, care and education of the public and health care providers. Some of the specific recommendations for screening and surveillance are briefed below.

Screening for CKD

Screening is an activity, whereby patients in a defined population who are not aware of CKD are tested to detect the disease and, if present, are subsequently treated to reduce the risk of progression of CKD and its complications. However, it is not known whether screening the general population would be cost-effective. Generally, targeted screening is recommended, where screening is conducted in subgroups of the population who would derive the most benefit from CKD detection.

Target groups should include patients with hypertension, diabetes and cardiovascular disease. Other groups might include families of patients with CKD, individuals with hyperlipidaemia, obesity, metabolic syndrome, smokers, patients treated with nephrotoxic drugs, patients with some chronic infectious diseases and cancers, and age > 60 years. In these groups, screening for CKD could be implemented using existing facilities for detection of other chronic diseases. Tests for CKD screening should include a urine test for proteinuria and a blood test for creatinine to estimate GFR. Verification of proteinuria would require two out of three positive tests. In the absence of specific recommendations, screening need not be more frequent than once per year.

Surveillance for CKD

Surveillance refers to an activity to provide key information on CKD, such as time, location, magnitude and severity, in order to guide implementation of medical and public health measures to control progression of CKD and its complications. It is recommended that all countries should have a surveillance programme for CKD Stages 4-5 (ESRD) and strive to include earlier stages. Surveillance for ESRD would enable countries to monitor the magnitude and the care of this high-risk, high-cost population. If possible, data on risk factors for development and progression of CKD can be included.

Conclusion

The burden of CKD, in terms of human suffering and economic costs, is exploding as we move through the early years of the 21st century, making it a major public health issue. We know how to prevent or delay the onset of CKD and to limit its progression. Unfortunately, the extent to which we have applied this knowledge, which can effectively reduce the burden of CKD, is disappointing. A comprehensive public health approach will be needed to effectively address this major health problem.

Sources:

Position Statement from Kidney Disease Improving Global Outcomes (KDIGO), United States Renal Data System (www.usrds.org), www.ANZDATA.org.au, www.cdc.gov/pcd/issues/2006/apr/05_0105.htm

Compiled by Dr. N. Janakan, Consultant Epidemiologist, Epidemiology Unit

Table 1: Vaccine-preventable Diseases & AFP

14th - 20th November 2009 (47thWeek)

Disease	No. of Cases by Province									Number of cases during current week in 2009	Number of cases during same week in 2008	Total number of cases to date in 2009	Total number of cases to date in 2008	Difference between the number of cases to date in 2009 & 2008
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	00	01	66	89	-25.8%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	01	-
Measles	00	00	01	00	00	00	00	00	01	01	03	165	108	+52.8%
Tetanus	00	00	00	00	00	00	00	00	00	00	00	27	35	-22.8%
Whooping Cough	00	00	00	0	0	00	00	00	01	01	00	61	46	+32.6%
Tuberculosis	103	03	12	00	03	35	17	09	34	216	131	9335	7575	23.2%

Table 2: Newly Introduced Notifiable Disease

14th - 20th November 2009 (47thWeek)

Disease	No. of Cases by Province									Number of cases during current week in 2009	Number of cases during same week in 2008	Total number of cases to date in 2009	Total number of cases to date in 2008	Difference between the number of cases to date in 2009 & 2008
	W	C	S	N	E	NW	NC	U	Sab					
Chickenpox	19	07	08	16	06	07	07	06	09	85	81	13987	4968	+181.5%
Meningitis	16 CB=7 KT=3 GM=6	04 KN=2 MT=1 NE=1	06 GL=5 MT=1	00	02 TR=1 KM=1	13 KR=10 PU=3	02 PO=1 AP=1	01 BD=1	08 RP=6 KG=2	52	28	1503	1199	25.3%
Mumps	04	01	01	00	02	00	01	00	04	13	36	1613	2682	-39.8%
Leishmaniasis	00	00	03 HB=1 MT=2	00	02 TR=2	00	00	00	00	05	Not available*	629	Not available*	-

Key to Table 1 & 2

Provinces: W: Western, C: Central, S: Southern, N: North, E: East, NC: North Central, NW: North Western, U: Uva, Sab: Sabaragamuwa.

DPDHS Divisions: CB: Colombo, GM: Gampaha, KL: Kalutara, KD: Kandy, ML: Matale, NE: Nuwara Eliya, GL: Galle, HB: Hambantota, MT: Matara, JF: Jaffna, KN: Killinochchi, MN: Mannar, VA: Vavuniya, MU: Mullaitivu, BT: Batticaloa, AM: Ampara, TR: Trincomalee, KM: Kalmunai, KR: Kurunegala, PU: Puttalam, AP: Anuradhapura, PO: Polonnaruwa, BD: Badulla, MO: Moneragala, RP: Ratnapura, KG: Kegalle.

Data Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Whooping Cough, Chickenpox, Meningitis, Mumps.

Special Surveillance: Acute Flaccid Paralysis.

Leishmaniasis is notifiable only after the General Circular No: 02/102/2008 issued on 23 September 2008.

Table 4: Surveillance of Communicable diseases among IDP's14th - 20th November 2009 (47thWeek)

Area \ Disease	Dysentery	Enteric fever	Viral Hepatitis	Chicken Pox	Watery Diar-rhoea
Vavunia	1	6	1	5	-
Chendikulam	1	2	1	47	186
Total	2	8	2	52	186

Table 4: Selected notifiable diseases reported by Medical Officers of Health

14th - 20th November 2009 (47thWeek)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	64	4102	5	228	1	13	5	217	2	90	45	1101	0	6	3	145	1	6	**85**
Gampaha	90	4106	3	158	1	22	1	46	0	38	16	447	0	9	5	251	1	6	**73**
Kalutara	12	1471	6	343	0	14	2	60	0	44	31	537	0	1	0	86	0	3	**92**
Kandy	26	3962	9	298	0	8	0	30	2	61	10	216	2	159	3	134	0	0	**68**
Matale	16	1855	4	138	0	4	1	32	0	26	2	317	0	5	1	88	0	2	**75**
Nuwara	3	249	3	396	0	2	4	177	2	803	1	44	1	74	6	91	0	0	**92**
Galle	4	598	3	237	0	10	0	4	0	111	5	207	0	15	2	32	0	6	**89**
Hambantota	6	908	1	90	0	8	0	8	0	15	0	90	0	83	0	52	0	0	**82**
Matara	4	1119	1	258	0	8	0	9	6	26	18	228	4	145	2	66	0	1	**88**
Jaffna	7	55	1	126	0	3	6	283	0	30	0	0	0	125	2	186	0	4	**43**
Kilinochchi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Mannar	0	6	1	100	0	1	2	117	0	23	0	0	0	1	0	69	0	0	**100**
Vavuniya	56	278	2	1635	0	25	9	692	0	3	0	7	0	5	1	3770	0	0	**75**
Mullaitivu	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**0**
Batticaloa	2	562	7	291	0	14	1	18	0	56	0	10	0	5	1	24	0	5	**73**
Ampara	4	229	2	96	0	1	0	12	0	8	0	14	0	2	1	91	0	0	**57**
Trincomalee	2	330	0	158	0	4	1	15	0	3	0	20	0	19	1	59	0	1	**80**
Kurunegala	20	2760	5	256	1	13	0	82	0	15	7	146	6	92	3	166	0	4	**90**
Puttalam	10	627	2	163	0	7	1	73	0	11	1	92	0	31	0	44	0	1	**67**
Anuradhapu	2	546	2	131	1	7	0	8	0	42	0	91	0	30	0	196	0	4	**74**
Polonnaruw	0	186	7	124	0	4	0	21	0	10	0	65	0	9	1	91	0	0	**71**
Badulla	7	343	12	382	0	5	1	56	0	34	2	92	0	133	2	315	0	1	**93**
Monaragala	2	168	1	148	0	2	0	23	0	36	0	15	2	64	1	93	0	2	**73**
Ratnapura	16	2026	1	499	0	20	1	53	0	43	12	338	0	36	15	233	0	2	**61**
Kegalle	22	3727	6	185	0	9	1	55	0	7	12	308	1	38	4	264	0	1	**100**
Kalmunai	8	242	0	109	0	2	0	15	3	7	0	7	0	3	1	22	0	0	**54**
SRI LANKA	**383**	**30455**	**84**	**6551**	**04**	**206**	**36**	**2107**	**15**	**1542**	**162**	**4392**	**16**	**1090**	**55**	**6568**	**02**	**49**	**76**

Source: Weekly Returns of Communicable Diseases WRCD).
*Dengue Fever / DHF refers to Dengue Fever / Dengue Haemorrhagic Fever.
**Timely refers to returns received on or before 20th November, 2009 Total number of reporting units =311. Number of reporting units data provided for the current week: 236
A = Cases reported during the current week. B = Cumulative cases for the year.

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ON STATE SERVICE

Dr. P. PALIHAWADANA
CHEIFEPIDEMIOLOGIST
EPIDEMIOLOGY UNIT
231, DE SARAM PLACE
COLOMBO 10