SAT-228

INFORMATION TECHNOLOGY USE IN THE CONTEXT OF CHRONIC KIDNEY DISEASE EPIDEMICS: ADVANCING KIDNEY HEALTH IN BRAZIL

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Introduction: The advancement of information technology (IT) observed during the last years, in parallel with important changes in the epidemiology of diseases, with the increase of non-communicable diseases, including chronic kidney disease (CKD). Patients and their families need to better understand the disease, to develop selfcare skills and adhere to treatment. The aim of this study is to describe the use of IT strategies in the context of CKD.
Methods: This is an exploratory and descriptive study developed as a partnership between the Post-graduation Program in Public Health and the Nucleus of Application in Information Technology of the University of Fortaleza, Brazil, in cooperation with researchers from the Erasmus University, The Netherlands, and the University of Madeira, Portugal. This study, which was called the "Renal Health" Project is developed in 3 main axes: development of the Renal Health application, research about CKD knowledge of the general population and development of educational content for distance learning (health education). Created in 2015, the main objective of this project is to spread information about preventive measures and CKD control, as well as to develop self-monitoring tools to help on treatment of this disease. The project was funded by the International Society of Nephrology through the Clinical Research Program, and is supported by the Brazilian Society of Nephrology (ISN) through its Clinical Research Program since 2017.
Results: By November 2018, we have developed the first version of the Renal Health app, for Android, in Portuguese, which was published on Google Play in July 2018. By the beginning of November 2018, it had 398 downloads. The iOS version is being finished. This app has sections for hemodialysis patients, kidney transplantation people and general population, containing information and self-monitoring tools. To our knowledge the research about CKD knowledge of general population is the first research about this in Brazil. The study is being carried out in the city of Fortaleza, Ceará, Brazil, and also in Portugal. The data is being collected through semi-structured interviews. Until now we have interviewed nearly 700 people. Preliminary results evidence low knowledge and awareness about CKD, even among those with high educational level. For distance health education materials were created in two channels, for internet users, a channel on YouTube and a profile on the social network Instagram, in order to share digital content about the CKD. Created in December 2017, (https://www.youtube.com/channel/UC3-GHeHAndcrRmbE4I_qE_w), the channel has three videos and 300 views. The first is about notions of Nephrology and concepts of CKD, the second on diagnosis "how the doctor discovers that a person has CKD" and the third is a tutorial for the use of the Renal Health app. Developed in June 2018, the profile on Instagram (https://www.instagram.com/renal_health) count on 200 publications and 747 followers.
Conclusions: Based on the increasing number of downloads, views and followers it is possible to realize that an interest about CKD exists, among the general population and CKD patients. The final results on CKD knowledge research can direct national campaigns and local measures to improve popular awareness about CKD.

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DIALYSIS IN ZIMBABWE

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Introduction: There is significant variation in the provision of dialysis treatment for end stage kidney disease globally. Data is essential to informing these treatment gaps, and the biggest gaps in knowledge of such treatment are seen in the African continent.
Methods: Supported by an International Society of Nephrology Clinical Research Program grant, we set out to measure the prevalence of dialysis in Zimbabwe using a prospective cohort design. All dialysis facilities in Zimbabwe participated in the study which measured a point prevalence in February of 2018. Consenting patients provided demographic data, medical history and treatment characteristics (including dialysis modality), with data collated at a central site. Ongoing prospective data collection continues to also measure the incidence and the survival of patients treated with dialysis at a national level. The study was approved by the Medical Research Council of Zimbabwe.
Results: Sixteen dialysis centres in Zimbabwe participated in the study, varying in size from 3 to 85 patients. At total of 485 patients were receiving any form dialysis in February of 2018, with a population estimate of 16.91m people, giving a dialysis point prevalence of 29 patients per million population. The vast majority of these patients were receiving haemodialysis (HD) 460 (95%), 3 of whom were receiving home haemodialysis, with only 25 (5%) receiving peritoneal dialysis (PD).

Consent was received from 353 (77%) HD patients, the majority of whom were male (253/353, 67 %). The mean age of patients was 53.2 years, 54.6 years for males and 50.6 years for females. Most patients had at least secondary education (309/353, 88%) and the majority were supported by health insurance (281/353, 77%).

Only 3 of the prevalent consenting patients were receiving HD for acute kidney injury. Most patients were receiving 2 HD sessions per week (261/353, 74%). A minority of patients were dialysing with an arterio-venous fistula (88/353, 25%) with the remainder using a subclavian catheter (173/353, 49%), internal jugular catheter (73/353, 21%) or a femoral catheter (19/353, 5%).

For the patients on peritoneal dialysis consent was obtained from 16(64%) and 56.3% were males. 62.5% had at least secondary school education and all of them were supported by health insurance. Currently all patients collect their PD solution from one centre in Harare and patients have to travel distances ranging from 1.5km to 434 km.
Conclusions: The prevalence of dialysis in Zimbabwe is 29 patients per million population, a rate consistent with other low income countries. This prospective study represents an ideal baseline to understand the effects of recent government commitments to expand access to dialysis and develop a greater understanding of the causes of kidney failure and their outcomes.

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OCCUPATIONAL HERBICIDE EXPOSURE AND DECLINING KIDNEY FUNCTIONS AMONG SUGARCANE FARMERS IN RURAL SRI LANKA.

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Introduction: Paraquat and Glyphosate were leading herbicides among Sugarcane Farmers (SF) hence occupational exposure is inevitable. These have been recently linked with the development of Chronic Kidney Disease of unknown aetiology (CKDu). Urinary KIM-1 and NGAL are good predictors of renal injury prior to detectable changes in serum creatinine and served as potential biomarkers in predicting tubulointerstitial damage. Although KIM-1 and NGAL are suggested to be useful biomarkers in determining kidney injury in rural Sri Lankan paddy farmers, no simultaneous studies have so far measured frequently used herbicides and their association with renal biomarkers. Therefore, the objective of this study was to measure Glyphosate and Paraquat levels in rural farmers in Sri Lanka in relation to traditional and novel renal biomarkers.
Methods: The present study was carried out at three locations in Rahathangama (RH) and Warunagama (WA) Grama Sevaka Divisions (GSD) in the Uva province, Matara (MA) in the Southern Province of Sri Lanka. Sugarcane farming is predominant in both RH and WA whereas paddy and vegetables in MA. Farmers over 20 years of age (n = 1935) representing RH, WA and MA were recruited based on the electoral

list. A pretested survey questionnaire was used to collect data. Our objective was to selected a probable highly herbicide-exposed group, therefore, participants (n = 1445) with less than 10 years of farming and lower working hours (< 600 hours per year) were first excluded. During the interview, selected farmers (n = 490) were also screened for co-morbid diseases and 142 were excluded. Finally, 348 farmers from all three locations were selected but 138 did not turn up for the sample collection. Urinary Glyphosate, Paraquat, KIM-I and NGAL levels were estimated using Enzyme-Linked Immunosorbent Assays. Urinary creatinine, microalbumin, Serum Creatinine, eGFR and ACR were also assessed. Ethics review committee of the Faculty of Medicine, University of Ruhuna approved the study.

Results: Herbicide residues and kidney injury biomarkers were higher in SF compared to the non-endemic controls in MA. Creatinine adjusted urinary Glyphosate (median 225; IQR 148-353 µg/g Cr) and Urinary Paraquat (median 0.75; IQR 0-2.1 µg/g Cr) was significantly higher in WA compared to MA (178; 147-225 & 0; 0 – 0.63 µg/g Cr). ACR in RA (median 14.9; IQR 5.4-393.1 mg/g Cr) and WA (23.7; 11.5-64.6) was significantly higher than MA (4.3; 2.2-6.7). This study reports 39 new confirmed cases of CKDu for the first time among SF in Sri Lanka. Urinary NGAL levels were significantly higher in both WA (median 2.14; IQR 1.28-6.15 ng/mg Cr) and RH (3.09; 1.15-9.09) compared to MA (1.28; 0.56-2.81). However, urinary KIM-I levels in RH (3.2; 1.29-106.1 ng/g Cr) and WA (3.6; 1.94-115.1) were not significantly higher in MA (1.74; 0.76-116.9). Urinary NGAL (r = 0.493), eGFR (r = -0.147) and ACR (r = 0.171) were significantly correlated with urinary Glyphosate but not with urinary Paraquat levels. Urinary KIM-1 levels were not correlated with either urinary Glyphosate or Paraquat.

Conclusions: The current study confirms higher urinary herbicide levels among SF in WA and RH, potentially due to occupational exposure subsequently result in declining kidney functions. This further supports that ACR, eGFR and NGAL may serve as better markers to detect renal injury among herbicide-exposed SF in rural Sri Lanka.

POSTER SESSION: EPIDEMIOLOGY, OUTCOMES AND HEALTH SERVICE RESEARCH IN CKD

POS16
13/04/2019
Exhibition hall (Doors 7 & 8)
12:00–13:15

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QUALITY OF LIFE AND BURDEN OF SYMPTOMS IN CHRONIC KIDNEY DISEASE PATIENTS UNDERGOING DIALYSIS IN SRI LANKA, A POPULATION-BASED STUDY USING AN ELECTRONIC RENAL REGISTRY.

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Introduction: Chronic kidney disease (CKD) is a public health priority in Sri Lanka with significant social and health related implications. Burden of physical and psychological symptoms experienced by patients living with the disease is known to adversely affect their quality of life (QoL). However, there is limited information on the quality of life and burden of symptoms experienced by patients receiving dialysis in Sri Lanka. This study aimed to assess the QoL and the nature, prevalence and self perceived severity (burden) of symptoms among patients with CKD receiving haemodialysis in Sri Lanka.

Methods: CKD patients receiving haemodialysis at 12 of the country's 13 nephrology units, where the electronic Sri Lanka Renal Registry was operational, were invited to participate. All patients recruited to the registry up to July 2016 were included. Trained research assistants assessed patients' QoL and the burden of physical and psychological symptoms by telephone interview using the Short Form 36 (SF-36)3 and the Dialysis Symptom Index (DSI) respectively. Thirty six measures of QoL were scored 0-100 (100 being highest perceivable quality of life). Prevalence and severity of 30 symptoms was reported using 5 point Likert scale (0 being no symptom, 5 being severe). The DSI score was calculated by the addition of the 30 individual scores with 150 indicating the highest possible burden of symptoms. Statistical analysis was done by using R. Ethical approval was obtained from Ethical Review Committee, Faculty of Medicine, University of Colombo, no EC-17-154.

Results: Interviews were conducted between July 2016 and January 2017. All 1335 patients recruited to the registry were screened; 455 patients were uncontactable, 19 patients were found to have died at the time of contact and 9 patients declined consent. Therefore, 852 patients were interviewed. Patient demographics and number of years receiving dialysis are described in Table 1. QoL was low (median 42.50). The most prevalent physical symptoms were, tiredness and lack of energy (73.33%), shortness of breath (65.95%), leg swelling (56.22%), muscle cramps (53.05%) and bone or joint pain (49.82%) and were moderately severe, 2.84 to 3.36 (Table 2), with 'tiredness and lack of energy' having the highest score for severity (3.36). The most prevalent psychological symptoms were, feeling worried (57.07%) and sadness (53.16%) with moderate severity (3.17 and 3.01). Median calculated DSI was 29.00.

Table 1.Patient characteristics.

Characteristic, N(%)	Data Availability, N (%)	Value, N (%)
Gender	843(98.94)	
Male		608(72.12)
Female		235(27.88)
Age in years	686(80.52)	
Mean		47.83
Median		48.00
standard deviation		13.67
Number of years since dialysis commenced.	401(47.07)	
< 6 months		
6 months - 1 year		209(52.12)
> 1 year		149(37.16)
		43(10.72)

Table 2. Prevalence and severity of individual symptoms for patients receiving dialysis (DSI).

Symptom	Availability, N (%)	Prevalence (%)	Severity (mean± sd)
Constipation	837(98.24)	29.39	2.95(0.84)
Nausea	838(98.36)	28.76	2.85(0.84)
Vomiting	838(98.36)	17.54	2.91(0.87)
Diarrhea	835(98.00)	10.42	2.87(0.87)
Decreased appetite	838(98.36)	46.78	3.30(0.97)
Muscle cramps	835(98.00)	53.05	2.84(0.82)
Swelling in legs	836(98.12)	56.22	3.09(0.95)
Shortness of breath	837(98.25)	65.95	3.31(1.01)
Lightheadedness or dizziness	837(98.25)	31.30	2.74(0.88)
Restless legs or difficulty keeping legs still	831(97.54)	21.54	3.01(1.02)
Numbness or tingling in feet	834(97.88)	39.09	2.87(0.91)
Feeling tired or lack of energy	836(98.12)	73.33	3.36(0.96)
Cough	834(97.89)	17.75	2.84(0.80)
Dry mouth	836(98.12)	36.12	2.85(0.95)
Bone or joint pain	835(98.00)	49.82	3.03(0.94)
Chest pain	836(98.12)	19.38	2.66(0.74)
Headache	834(97.89)	28.54	2.71(0.85)
Muscle soreness	831(97.53)	38.63	2.93(0.92)
Difficulty concentrating	831(97.54)	29.96	2.83(0.81)
Dry skin	836(98.12)	36.96	2.81(0.89)
Itching	836(98.12)	26.20	2.78(0.87)
Worrying	834(97.89)	57.07	3.17(1.03)
Feeling nervous	832(97.65)	42.91	2.88(0.89)
Trouble falling asleep	835(98.00)	43.83	3.24(0.98)
Trouble staying asleep	835(98.00)	43.35	3.17(0.96)
Feeling irritable	834(97.89)	47.12	2.93(0.90)
Feeling sad	837(98.24)	53.16	3.09(1.05)
Feeling anxious	834(97.89)	41.97	2.88(0.88)
Decreased interest in sex	648(76.06)	34.72	2.21(1.27)
Difficulty becoming sexually aroused	605(71.01)	30.08	2.17(1.32)

Conclusions: This first output from a Lower Middle-Income Country electronic renal registry reports that patients with CKD receiving dialysis have a low quality of life, despite selection and response bias, and considerable loss to follow up. More than two thirds of patients report at least one moderately severe physical symptom, and over half reported feelings of worry and sadness. Work is underway to look at association between QoL, treatment efficacy and the most prevalent physical symptoms (shortness of breath, muscle cramps and pain). The role of the registry in linking patients to existing psychosocial services is being explored.