OP-0235: A Randomized Quality Improvement Study Using the Web-based Multi-component Joint Asia Diabetes Evaluation (JADE) Program

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Background

- Insufficient time, infrequent assessment of risk factors, lack of continuation and variations of care, treatment non-adherence and frequent default result in poor clinical outcomes in type 2 diabetes (T2D).
- The multi-component JADE program uses a nurse to assist doctors collect clinical information guided by the JADE portal with built-in care protocols, validated risk engines, personalized report and reminders triggered by attained HbA1c, blood pressure (BP), LDL-C and body weight (BW) to help doctors identify treatment gaps and improve patient self management.
- Using this team approach augmented by information technology, we have reported the utility of the JADE Program in reducing clinical inertia, treatment non-adherence, cardiometabolic risk factors and defaults rates in Chinese patients with T2D.¹⁻³

Objective

- We examined the feasibility, acceptability and effectiveness of implementation of the JADE Program using a nurse coordinator in a wide range of private, public and subsidized care settings in Asia.

Methods

- Each site was given access to the JADE Portal and a grant to support a nurse to recruit 600 patients with T2D for eye, feet, blood and urine examination (J) at baseline and 1 year.
- At each site, half of the patients had at least 2 phone or face-to-face follow-up contacts by the nurse during the 1-year period.
- In phase 1 study, all patients were given the JADE personalized report with or without nurse contact (J+R+N vs J+R).
- In phase 2 study, only patients who had additional nurse visit were given the JADE report (J+R+N vs J-R).

Figure 1: Study Flow Diagram

Results

- Between 2012 and 2015, 15192 T2D patients were recruited from 48 sites in Asia (India, Indonesia, Malaysia, Philippines, Singapore, Taiwan, Thailand, Vietnam) with analyzable baseline data.
- Clinical profile: male (55.1%), age (mean±SD: 56.9±11.5 years), disease duration [median (IQR): 8 (4-14) years], current smokers (9.4%), history of arteriosclerotic-cardiovascular disease including heart failure (15.7%), chronic kidney disease (18.5%) and cancer (1.9%).

- Control of risk factors at baseline: HbA1c<7% (30.2%), BP(23.8%), LDL-C<2.6mmol/L (57.5%), use of statins (38.4%) and RAS inhibitors (32.6%).
- Key Performance Indexes (KPI): reduction (Δ) in HbA1c≥0.5%, Δ systolic BP≥5 mmHg, Δ LDL-C≥0.5 mmol/L and Δ BW≥3%.
- At 12 months, 8488 (55.9%) patients returned for repeat assessment. Of these, 5137 (74.4 %) had achieved at least 1 KPI, more so in the J+R+N group compared to the J group (Table 1).
- The J+R+N group also had a lower default rate than the J group in both phase 1 and phase 2 sites with defaulters being younger, having fewer complications/morbidities but worse risk factor control (Table 2).
- Structured assessment improved risk factor control which was enhanced by issue of a personalized report, while patient engagement by nurses between medical clinic visits reduced default rate.

Table 1: Clinical characteristics by intervention groups

	Whole group (N=15192)			Phase 1 (N=7282)			Phase 2 (N=7910)		
	J+R+N (N=7652)	J (N=7540)	P-value	J+R+N (N=3616)	J+R (N=3666)	P-value	J+R+N (N=4036)	J-R (N=3874)	P-value
<u>Baseline characteristics</u>									
Mean age (years)	56.8±11.5	57.1±11.6	0.106	59.7±11.2	59.7±11.3	0.738	54.1±11.1	54.6±11.3	0.038
Male (%)	4146(55.1)	4220(55.0)	0.841	1886(52.2)	1907(52.0)	0.906	2334(57.8)	2239(57.8)	0.976
Disease Duration (years)	8(4-14)	9(4-14)	<0.001	9(5-12)	10(5-15)	0.305	7(3-13)	8(3-13)	0.102
Systolic blood pressure (mmHg)	131.5±16.8	131.6±16.7	0.755	133.7±17.4	133.5±16.3	0.658	129.5±15.9	129.7±16.1	0.545
Diastolic blood pressure (mmHg)	79.0±8.9	79.0±9.0	0.896	79.1±9.3	78.9±9.4	0.512	79.0±8.6	79.1±8.6	0.613
HbA _{1c} (%)	8.1±1.9	8.1±1.9	0.499	7.8±1.7	7.9±1.8	0.176	8.4±2.1	8.4±2.0	0.086
LDL-cholesterol (mmol/L)	2.4(1.9-3.0)	2.5(1.9-3.1)	0.606	2.4(1.9-3.0)	2.5(2.0-3.0)	0.144	2.5(1.9-3.1)	2.5(2.0-3.0)	0.046
Body Mass Index (kg/m ²)	27.1±4.9	26.9±4.9	0.047	26.6±4.7	26.5±4.7	0.846	27.5±5.0	27.3±5.1	0.020
Coronary Heart Disease and Cardiovascular Disease (%)	1241(16.4)	1139(15.1)	0.059	567(15.7)	564(15.4)	0.728	674(16.7)	575(14.8)	0.024
Any history of cancer (%)	144(1.9)	143(1.9)	0.947	121(2.3)	112(3.1)	0.480	23(0.6)	31(0.8)	0.214
Diabetic Kidney Disease (%)	1423(18.6)	1387(18.4)	0.749	752(20.8)	756(20.6)	0.854	671(16.6)	631(16.3)	0.024
Any 2 ABC targets*	2149(28.1)	2074(27.5)	0.427	1167(32.3)	1106(30.2)	0.053	982(24.3)	968(25.0)	0.499
<u>Clinical characteristics at year 1</u>									
Defaulters for assessment	3185(41.6)	3519(46.7)		1257(34.8)	1482(40.4)		1928(47.8)	2037(52.6)	
Non-defaulters for assessment	4467(58.4)	4021(53.3)	<0.001	2359(65.2)	2184(59.4)	<0.001	2108(52.2)	1837(47.7)	<0.001
<u>Non-defaulters</u>									
Systolic blood pressure (mmHg)	130±14.0	131.8±15.3	0.004	133.6±16.0	137.0±16.4	0.387	127.7±12.0	129.1±13.4	0.001
Diastolic blood pressure (mmHg)	78.5±8.1	78.7±8.6	0.123	78.2±9.1	78.4±9.5	0.460	78.8±6.8	79.2±7.2	0.079
HbA _{1c} (%)	7.5±1.5	7.6±1.5	0.026	7.5±1.5	7.6±1.5	0.108	7.5±1.5	7.6±1.6	0.121
LDL-cholesterol (mmol/L)	2.3±0.9	2.5±1.0	<0.001	2.4±0.9	2.5±0.9	0.057	2.3±0.9	2.5±1.1	<0.001
Body Mass Index (kg/m ²)	27.0±5.0	27.0±4.8	0.016	26.3±4.7	26.4±4.7	0.515	27.8±5.2	27.2±4.8	<0.001
Number of Key Performance Indexes (KPI)**	0	856(24.1)	913(27.2)		569(27.4)	583(29.4)		287(19.5)	330(24.0)
	1	1418(39.9)	1343(40.0)		865(41.6)	787(39.7)		553(37.5)	556(40.4)
	2	873(24.6)	820(24.4)	<0.001	447(21.5)	451(22.8)	0.267	426(28.9)	369(26.8)
	3	350(9.9)	249(7.4)		173(8.3)	143(7.2)		177(12.0)	106(7.7)
	4	53(1.5)	31(0.9)		23(1.1)	17(0.9)		30(2.0)	14(1.0)
At least 2 KPI **	1276(35.9)	1100(32.8)	<0.001	643(31.0)	611(30.8)	0.937	633(43.0)	489(35.6)	<0.001
*ABC targets: HbA1c<7%, BP<130/80 mmHg, LDL-C<2.6 mmol/L									
**KPI: reduction (Δ) A1c≥0.5%, Δ systolic blood pressure≥5 mmHg, Δ LDL-C≥0.5 mmol/L, Δ body weight ≥3%									

Table 2: Clinical characteristics of defaulters vs non-defaulters

	Defaulter (n=6704)	Non-defaulter (n=8488)
Age (years) **	55.4±11.7	58.1±11.3
Male (%) *	3753 (56.0)	4613 (54.3)
Current/ex-smoker (%) **	609 (9.2)	811 (9.6)
Disease duration (years) **	7 (3-13)	9 (4-15)
Coronary Heart Disease and Cardiovascular Disease (%) **	919 (13.7)	1461 (17.2)
Diabetic Kidney Disease (%) **	1094 (16.3)	1716 (20.2)
Any Cancer (%) **	53 (0.8)	234(2.8)
HbA1C<7%(%) **	1451 (24.5)	2846 (34.3)
Blood Pressure <130/80mmHg (%) **	1376 (21.1)	2183 (25.9)
LDL-C<2.6mmol/L (%) **	3011 (53.3)	4810 (60.5)
** p<0.001; * p<0.05		

Conclusion

- In real world practice, more than 1 in 3 Asian patients with T2D had complications with suboptimal control of cardiometabolic risk factors, under-usage of organ-protective drugs and frequent default.
- Care organization using a doctor-nurse team to perform structured assessment, augmented by informational technology, with personalized reporting and empowerment improved shared decision making and quality of care.

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