Prevalence Trend of Renal Replacement Therapy in Thailand: Impact of Health Economics Policy

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Objective: *The national health insurance fund in Thailand initiated by the national health security act in November, 2002. In October 2007, the national health insurance fund launched the first renal replacement therapy (RRT) reimbursement plan by the "Peritoneal Dialysis-First" (PD First) policy. The rationale of the PD First Policy resulted from the perspective that PD for end stage renal disease (ESRD) treatment offers the most economic and efficient outcome. The present study was conducted to determine whether the increase of RRT penetration by national health policy could impact the national RRT prevalence.*

Material and Method: *The Thailand Renal Replacement Therapy (TRT) database in 2007, 2008, and 2009 were retrieved and analyzed.*

Results: *By TRT registry data, the total yearly prevalence of RRT increased by an average of 14.8% after the implementation of national health insurance and the "PD First" policy from 2007 to 2009. The total yearly prevalence of hemodialaysis (HD) modestly increased (14.7%) while the total yearly prevalence of PD remarkably expanded by 107.3%. The yearly incidence of all RRT modalities increased by an average of 34.8% in 2007 to 2009. The yearly incidence of HD modestly increased (8.1%) while the total yearly incidence of PD remarkably elevated by 157.8%. Civil Servants Medical Benefit Compensation (CSMBS) was the major funding source of RRT cases (34.5%) while national health insurance funding was the second major funding source (26.0%). From 2007-2009, the CSMBS funding was the majority of HD while national health insurance funding was the majority of PD. The sharing of PD by national health insurance increased from 33.9% in 2007, 58.6% in 2208, and 77.2% in 2009.*

Conclusion: *The coverage of ESRD patients by national health insurance fund by the "PD First" policy impacted the RRT prevalence and incidence both the total prevalence and total incidence due to the universal penetration to RRT treatment of Thai population. Also, the policy altered the RRT modality predisposition. PD modality will finally be the majority of Thai RRT modalities if the policy can be managed successfully.*

Keywords: *"PD First" policy, Renal Replacement Therapy, TRT registry data, National health insurance funding*

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Prior to 1990, the only funding source of renal replacement therapy (RRT) in end stage renal disease (ESRD) patients in Thailand was the government reimbursement for the government servant (Civil Servants Medical Benefit Compensation; CSMBS) and state enterprise reimbursement of their employees. The CSMBS is administered under the Ministry of Finance while the state enterprise reimbursement is administered under each organization; for example, the Port Authority of Thailand, Electricity (PAT), Generating Authority of Thailand (EGAT) etc. Besides, there were

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charity organizations which contributed limited funding for hemodialysis (HD) treatment to patients who were unaffordable to RRT. The ESRD patients who had not been covered had to self-pay or needed a private insurance for RRT.

In September 1990, the social security fund initiated by the social security act to conduct the compulsory health insurance financed by tripartite contributors namely; the employer, the employee and the government. The social security fund offered the HD reimbursement at the beginning and now covered all three RRT modalities (HD, PD and kidney transplantation). The social security fund covers more than 8 million of working aged population.

The national health insurance fund initiated by the national health security act in Nov, 2002 to conduct the universal coverage of tax-financed health insurance for the majority of the population who had not been covered by any health reimbursement scheme. This national health insurance fund created a large national health insurance fund to pay providers at a prospective capitation rate for patients within a specified budget ceiling using Diagnosis Related Group (DRG) weights as criteria for reimbursement. The national health insurance fund covers more than 48 million populations which is the majority of the total of 63.5 million Thai population. In October 2007, the national health insurance fund launched the first RRT reimbursement plan by the "Peritoneal Dialysis-First" (PD First) policy and then extended for kidney transplantation. The rationale of the "PD First" policy resulted from the prospective that PD for ESRD treatment offers the most economic and efficient outcome and allowed ESRD patients who are not suitable for PD or failed PD by the "PD First" policy eligible for HD. The increase of RRT penetration by national health policy impacts the national RRT prevalence which is evidenced in Thailand Renal Replacement Therapy (TRT) registry data. TRT registry has been the registry initiated since 1997[1] for all RRT centers in Thailand by the Nephrology Society of Thailand. The registry covers all RRT centers including HD, PD, and kidney transplantation (KT) by collaboration with the Transplantation Society of Thailand. The entry of the data by RRT centers has been required as the RRT quality assurance and has been a critical issue for RRT center quality accreditation. The registry data provide national RRT status which may translate the burden of ESRD in the nation[2] and may direct policy maker or health economic authorities to tailor the strategy for health benefit maximization.

The authors analyzed the TRT registry data before the implementation of the "PD First" policy in 2007, 2008, and one year after the implementation (2009) to present study the prevalence trend of different RRT modalities and impact of the policy for the access to RRT treatment of the country.

Material and Method

The TRT database in 2007, 2008 and 2009 were retrieved. The yearly prevalence and yearly incidence of all RRT modalities namely HD, PD and KT were tabulated for comparison regarding total number of cases and patient per million population (PMP). The yearly kidney transplantation prevalence and incidence in TRT database were confirmed with kidney transplantation database of the Transplantation Society of Thailand. The RRT cases were classified by the reimbursement plan. Each reimbursement plan namely CSMBS, social security fund, and national health insurance was tabulated for comparison.

Statistical analysis

The prevalence of total RRT and RRT modalities were presented as case number and PMP. The distribution of cases was presented by percentage of the total cases. The calculation was performed on a desktop computer, using MedCalc Software version 10 (MedCalc Software, Mariakerke, Belgium).

Results

Total prevalence of RRT patients

In 2009, the yearly prevalence of patients on all RRT modalities was 35,112 cases (552.8 pmp) (Table 1, Fig. 1). From 2007 to 2009, the yearly prevalence of all RRT modalities increased by an average of 14.8% after the implementation of the "PD First" policy. In 2009, out of 35,112 RRT patients, 27,056 cases were HD (425.9 pmp), 5,133 cases were PD (80.8 pmp) and 2,923 cases were KT (46.0 pmp). From 2007 to 2009, the yearly prevalence of HD modestly increased (14.7%) while the total yearly prevalence of PD remarkably elevated by 107.3%. The yearly prevalence of KT was static due to the limitation of organ donor.

Total yearly incidence of RRT patients

In 2009, the yearly incidence of patients on all RRT modalities was 7,825 cases (123.2 pmp) (Table 2, Fig. 2). After the implementation of the "PD First" policy, the yearly incidence of all RRT modalities increased by an average of 34.8% of annual incidence in 2007 to 2009. In 2009, out of 7,825 new RRT patients, 3,991

Table 1. Yearly prevalence of renal replacement therapy patients in 2007-2009

	2007 (pmp)	2008 (pmp)	2009 (pmp)
Hemodialysis	20,641 (327.4)	26,438 (417.1)	27,056 (425.9)
Peritoneal dialysis	1,198 (19.0)	2,760 (43.5)	5,133 (80.8)
Kidney transplantation*	3,618 (57.4)	2,298 (36.3)	2,923 (46.0)
Total	25,457 (419.9)	31,496 (496.9)	35,112 (552.8)

* Data from Thai Transplantation Society

Table 2. Yearly incidence of renal replacement therapy patients in 2007-2009

	2007 (pmp)	2008 (pmp)	2009 (pmp)
Hemodialysis	**3,410 (54.10)	4,688 (73.96)	3,991 (62.83)
Peritoneal dialysis	528 (8.37)	1,330 (20.98)	3,532 (55.60)
Kidney transplantation*	370 (5.87)	342 (5.39)	308 (4.84)
Total	4,308 (68.34)	6,360 (100.34)	7,825 (123.18)

* Data from Thai Transplantation Society, ** Data adjusted for 2007

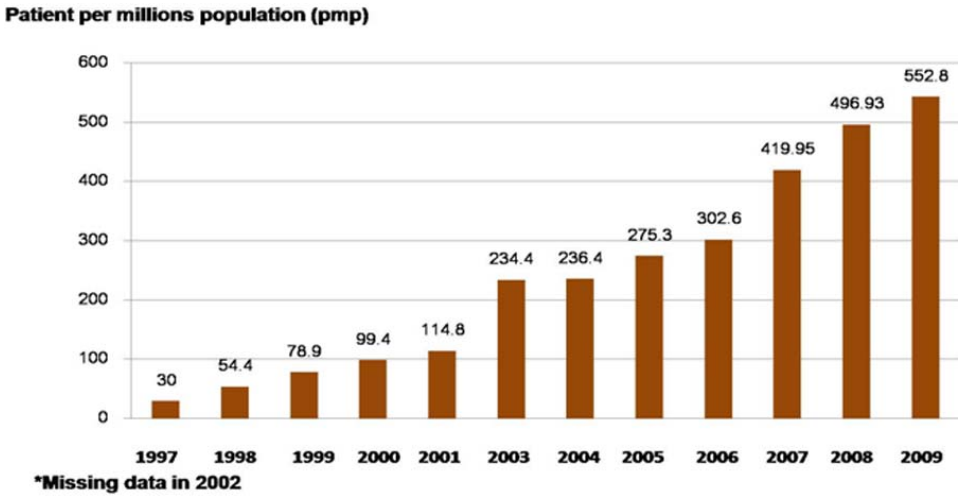

Fig. 1 Yearly prevalence trend of renal replacement therapy in patients in Thailand in 1997-2009

cases were new HD (62.83 pmp), 3,532 cases were new PD (55.60 pmp) and 308 cases were new KT (4.84 pmp). From 2007 to 2009, the yearly incidence of HD modestly increased (8.1%) whereas the yearly incidence of PD remarkably expanded by 157.8%. As in yearly prevalence, the yearly incidence of kidney transplantation was static.

Sharing of RRT by reimbursement fund

In 2009, CSMBS was the major funding source of RRT cases (34.5%) while national health insurance fund was the second major funding (26.0%) and the social security fund for RRT was the third major funding (14.8%).

The sharing of RRT in 2007-2009 by different RRT funding had different predisposition (Table 3 and 4). From 2007-2009, the CSMBS funding was the majority of HD. CSMBS and social security funding predisposed HD and varied from 38.5-41.3% and 16.9-17.4% respectively while national health insurance funding shared HD sponsoring from 4.8% in 2007, 13.5% in 2008 and 16.4% in 2009 (Table 3).

The CSMBS sharing for PD decreased from 48.6% in 2007, 30.3% in 2008, and 13.6% in 2009. The decrease of PD sharing by CSMBS funding is caused by the remarkable increase in sharing of PD by national health insurance RRT funding. The sharing of PD by national health insurance increased from 33.9% in 2007, 58.6% in 2008, and 77.2 % in 2009 (Table 4) while the sharing of PD by social security fund was trivial and static (2.3-4.2%).

Discussion

The authors' data showed the impact of health

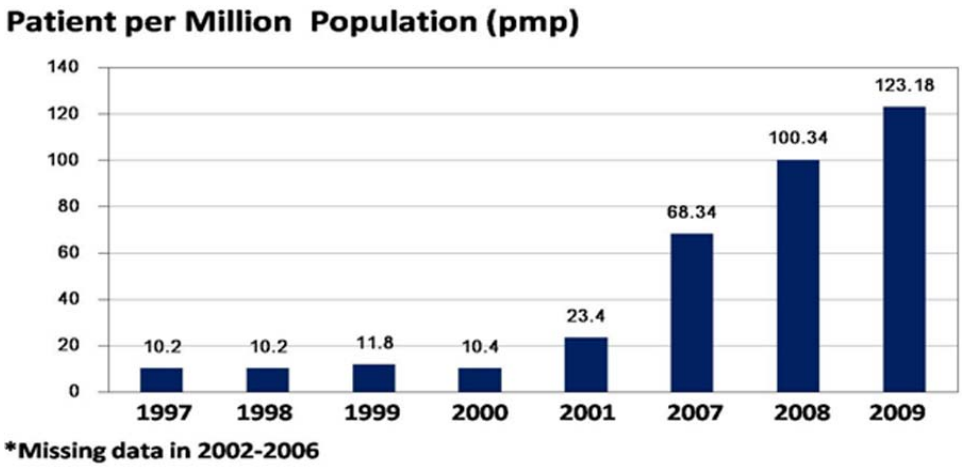

Fig. 2 Yearly incident tread of renal replacement therapy in patients in Thailand in 1997-2009

Table 3. The sharing of HD by different reimbursement schemes in 2007-2009

	2007 cases	2008 cases	2009 cases
Self payment	4,661 (31.4%)	4,716 (24.79%)	4,675 (23.1%)
Social security fund	2,568 (17.4%)	3,229 (16.98%)	3,474 (17.2%)
States enterprise reimbursement	601 (4.1%)	716 (3.76%)	800 (4.0%)
Government reimbursement	6,103 (41.3%)	7,609 (40.0%)	7,782 (38.5%)
National health security office fund	706 (4.8%)	2,576 (13.54%)	3,332 (16.4%)
Charity organization	170 (1.1%)	175 (0.92%)	160 (0.8%)
Total	14,792 (100%)	19,021 (100%)	20,223 (100%)

Missing data 2009 = 6,833

Table 4. The sharing of PD by different reimbursement schemes in 2007-2009

	2007 cases	2008 cases	2009 cases
Self payment	86 (9.5%)	120 (6.2%)	217 (5.7%)
Social security fund	38 (4.2%)	57 (2.9%)	88 (2.3%)
States enterprise reimbursement	25 (2.8%)	27 (1.4%)	29 (0.8%)
Government reimbursement	438 (48.6%)	591 (30.3%)	514 (13.6%)
National health security office fund	305 (33.9%)	1,142 (58.6%)	2,922 (77.2%)
Charity organization	9 (1.0%)	12 (0.6%)	15 (0.4%)
Total	901 (100%)	1,949 (100%)	3,785 100%)

Missing data 2009 = 1,348

policy (PD First) by national health insurance towards the RRT penetration and RRT modalities. The rationale of the "PD First" policy in Thailand resulted from the perspective that PD for ESRD treatment offers the most economic and efficient outcome and from the successful landmark of the "PD First" policy in Hong Kong[3].

Maintenance dialysis is an expensive treatment for ESRD patients. A health economic study[4] showed the benefit of PD compared with HD from both the government's and society's perspective. PD was found to be less expensive than in-centre HD. The overall proportional utilization of PD by patients currently undergoing dialysis globally is lower than the utilization of HD and the growth in PD use remains modest except in Hong Kong. In Hong Kong, more than 80% of RRT patients receive PD, the highest reported rate worldwide, which results from the "PD First" policy. The establishment of the "PD First" policy in Hong Kong has contributed significantly to the development of a successful RRT program since 1960[5]. The "PD First" policy promotes PD as the first dialysis modality for all ESRD patients unless contraindicated. A cost analysis in Hong Kong indicates that the yearly expenditure for a patient receiving PD is about 40% of that for a patient receiving hemodialysis[6]. The proportion of ESRD patients receiving PD in Hong Kong was more than 80% of the entire dialysis population in 2006, an increase from 40% in 1985[6]. Data from the Hong Kong Renal Registry demonstrated comparable patient survival for PD and hemodialysis[7]. Patient body size relative to dialysate volume may contribute to the success of the PD program in Asia. Small-volume PD (6 L daily) is successfully practiced because of the smaller body mass of Asian patients[8].

Comparison of RRT prevalence in 2007, 2008, and 2009 in Thailand showed increase RRT prevalence resulted from Thai PD First policy which offered universal coverage to all ESRD patients by PD. The yearly PD prevalence and incidence increased 107.3%, 157.8% and 77.2% of cases funded by national health insurance. PD nurses play a crucial role in training patients and family members to use equipment that is provided free of charge under universal coverage.

It remains too early to ascertain the success of the "PD First" policy in Thailand. However, this policy allows all ESRD to be covered for RRT and the authors can claim that none in Thailand will be expired form the un-affordability to dialysis. Moreover, the "PD First" policy save rural patients the twice-weekly fares to visit the HD centre in the provincial city, the situation of which poor patients cannot afford. The major barrier of PD success is the risk of infection and subsequent expenses associated with peritonitis. For the years to come, the peritonitis rate will destine the sustainable PD program in Thailand.

Conclusion

The coverage of ESRD patients by the national health insurance fund by the "PD First" policy impacts the RRT prevalence and incidence trend both the total prevalence and incidence due to the universal penetration to treatment of Thai population. Also, the policy changed the RRT modality predisposition. PD modality will finally be the majority of Thai ESRD population if the program can be managed successfully as in Hong Kong.

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Potential conflicts of interest

None.

References

1. Praditpornsilpa K, editor. Thailand renal replacement therapy registry year 2007. Bangkok: The Nephrology Society of Thailand; 2007.
2. Praditpornsilpa K, editor. Thailand renal replacement therapy registry report 2010. Bangkok: The Nephrology Society of Thailand; 2010.
3. Li PK, Szeto CC. Success of the peritoneal dialysis programme in Hong Kong. Nephrol Dial Transplant 2008; 23: 1475-8.
4. Teerawattananon Y, Mugford M, Tangcharoensathien V. Economic evaluation of palliative management versus peritoneal dialysis and hemodialysis for end-stage renal disease: evidence for coverage decisions in Thailand. Value Health 2007; 10: 61-72.
5. Yu AW, Chau KF, Ho YW, Li PK. Development of the "peritoneal dialysis first" model in Hong Kong. Perit Dial Int 2007; 27 (Suppl 2): S53-5.
6. Li PK, Chow KM. The cost barrier to peritoneal dialysis in the developing world-an Asian perspective. Perit Dial Int 2001; 21 (Suppl 3): S307-

13.
7. Ho YW, Leung CB, Choy BY, Fung KS, Wong PN, Cheng YL, et al. Renal registry and peritoneal dialysis management: the Hong Kong perspective. Perit Dial Int 2008; 28 (Suppl 3): S12-4.
8. Lam MF, Tang C, Wong AK, Tong KL, Yu AW, Li CS, et al. ASPD: A prospective study of adequacy in Asian patients on long term, small volume, continuous ambulatory peritoneal dialysis. Perit Dial Int 2006; 26: 466-74.

แนวโน้มอุบัติการณ์การรักษาบำบัดทดแทนไตในประเทศไทย: ผลจากนโยบายเศรษฐศาสตร์สุขภาพ

เกื้อเกียรติ ประดิษฐ์พรศิลป์, สุขฤทัย เลขยานนท์, นลินี เปรมัษเฐียร, พรชัย กิ่งวัฒนกุล, อดิสรณ์ ลำเพาพงศ์, พงศธร คชเสนี, อัมพร สกุลแสงประภา, วิศิษฏ์ ประสิทธิศิริกุล, บรรยง ภักดีกิจเจริญ, กำธร ลีลามะลิ, ทวีชัย ทีปประสาน, ฉัตรสุดา เอื้อมานะพงษ์, เบญจพร ลีละวัฒน์, จินตนา พงษ์พิยเดช, สร้อยสะอาง สร้างสมวงษ์, เถลิงศักดิ์ กาญจนบุษย์, สมชาย เอี่ยมอ่อง, เกรียงศักดิ์ วารีแสงทิพย์, ดุสิต ล้ำเลิศกุล

วัตถุประสงค์*: นโยบายการประกันสุขภาพถ้วนหน้าในประเทศไทย เริ่มในปี พ.ศ. 2545 และในเดือนตุลาคม พ.ศ. 2550 การดำเนินงานได้ครอบคลุมการบำบัดทดแทนไตโดยนโยบาย "พีดีเฟิรสท์" โดยใช้สมมุติฐานว่าการล้างไตทางหน้าท้องเป็นการรักษาที่มีประสิทธิผลในเชิงผลลัพธ์ และเศรษฐกิจมากที่สุดเมื่อเทียบกับวิธีอื่นๆ การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาผลจากนโยบายนี้ต่อแนวโน้มอุบัติการณ์การรักษาบำบัดทดแทนไตในประเทศไทยก่อนเริ่มใช้นโยบายในปี พ.ศ. 2550 จนถึงหลังใช้นโยบายเป็นเวลา 1 ปี ใน ปี พ.ศ. 2552*

วัสดุและวิธีการ*: โดยการดึงข้อมูลจากฐานข้อมูลการลงทะเบียนบำบัดรักษาทดแทนไต ซึ่งดำเนินการโดยอนุกรรมการลงทะเบียนการบำบัดรักษาทดแทนไต สมาคมโรคไตแห่งประเทศไทยในปี พ.ศ. 2550, พ.ศ. 2551 และ พ.ศ. 2552 และเพื่อทำการวิเคราะห์ข้อมูล*

ผลการศึกษา*: หลังเริ่มนโยบาย "พีดีเฟิรสท์" อุบัติการณ์ต่อปีของการบำบัดรักษาทดแทนไตในประเทศไทยเพิ่มขึ้นเฉลี่ยร้อยละ 14.8 ต่อปี โดยอุบัติการณ์ต่อปีของการล้างไตทางหน้าท้องเพิ่มขึ้นมากถึงร้อยละ 107.3 ขณะที่อุบัติการณ์ต่อปีของการฟอกเลือดเพิ่มขึ้นเพียงร้อยละ 14.7 และพบว่าอุบัติการณ์ต่อปีของผู้ป่วยใหม่เพิ่มขึ้นเฉลี่ยร้อยละ 34.8 ต่อปี โดยอุบัติการณ์ต่อปีของผู้ป่วยใหม่ของการล้างไตทางหน้าท้องเพิ่มขึ้นมากถึงร้อยละ 157.8 ขณะที่อุบัติการณ์ผู้ป่วยใหม่ของการฟอกเลือดเพิ่มเพียงร้อยละ 8.1 กรมบัญชีกลางเป็นต้นสังกัดของการบำบัดทดแทนไตคิดเป็นร้อยละ 34.5 ขณะที่สำนักงานประกันสุขภาพถ้วนหน้าเป็นต้นสังกัดร้อยละ 26 โดยกรมบัญชีกลางเป็นต้นสังกัดหลักของการฟอกเลือดขณะที่สำนักงานประกันสุขภาพถ้วนหน้าเป็นต้นสังกัดหลักของการล้างไตทางหน้าท้องคิดเป็นร้อยละ 33.9 ในปี พ.ศ. 2550, ร้อยละ 58.6 ในปี พ.ศ. 2551 และ ร้อยละ 77.2 ในปี พ.ศ. 2552*

สรุป*: นโยบาย "พีดีเฟิรสท์" ของระบบการประกันสุขภาพถ้วนหน้ามีผลต่อแนวโน้มอุบัติการณ์การบำบัดรักษาทดแทนไตในประเทศไทยทั้งตัวเลขอุบัติการณ์ และแนวโน้มของวิธีการรักษา โดยนโยบายดังกล่าว PD จะเป็นวิธีการรักษาหลักในประเทศไทยในที่สุด หากการดำเนินนโยบายประสบความสำเร็จ*