Dialysis therapy in Czech Republic – data of Registry of dialysis patients

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History of dialysis treatment in Czech Rep. – first acute hemodialysis

- **1955 – first HD in Central Europe**
  - MUC.Daum, Dr.Hornych, Dr.Chytil (2.Dpt.Med.)
  - Alwall dialysis device
  - 5.HD unit in Europe
  - ARF - intoxication sublimat
  - altogether 3 successful HD sessions
First dialysis team in Prague - 1955:

Physicians (from right):
- S. Daum,
- M. Chytil
- K. Cholinský
- A. Hornyč
- Fialová-Přečechtělová

nurse:
- M. Mrowcziková

further:
surgeons (vessel access)
- E. Hradec
- Bureš
First acute hemodialysis performed in II.dept. med. in Prague year 1955;
- Dr.Daum
- Dr.Chytil
First successful kidney transplant – 21.3.1966
Development of chronic dialysis treatment in Czechoslovakia (1968-1989)
Hemodialysis therapy in Czechoslovakia in 1973 (558 pts, 15,827 sessions)

Matoučovic, Rychlík, Sulková: Hereditatis petitio české nefrologie, TIGIS, 2009
Historical and current RRT data collection in CR

A/ 1969 – Registry of dialysis therapy and transplantation in Czechoslovakia

After 1989 – velvet revolution, 1993 split of Czechoslovakia
B/ since 1993 - **Statistical Yearbooks** of dialysis therapy in Czech Rep., 100% pts covered
   - only cross-sectional data reported yearly on 31.12.

C/ since 2006 - **Registry of dialysis patients** (RDP) – run by the Czech Soc. of Nephrology,
   - based on individual patient reported data, voluntary, ~ 80% pts covered
   - regular follow-up of patients

D/ since 2003 - **Registry of transplanted pts:** waiting list + all transplantations/yr
   - no follow-up available
   - run by state authority (Ministry of Health), obligatory, 100% pts covered

[www.nefro.cz](http://www.nefro.cz)
Czech Society of Nephrology

STATISTICAL YEARBOOK
of Dialysis Treatment
in the Czech Republic
in year 2015

On behalf of the Czech Society of Nephrology with co-operation with ProDos company prepared:
Prof. Ivan Rychlík, MD, PhD, FASN, FERA
Assoc. Prof. Ing. František Lopot, PhD
Czech Registry of dialysis patients - 2015

- population 10.5 million inhabitants
- 106 dialysis centers in the Czech Republic. All of them are invited to contribute to registry data.
- 6668 patients in chronic dialysis in Czech Republic, i.e. 635 patients per million inhabitants.
- 465 patients treated by peritoneal dialysis (6,9%).
  - kidney transplant 453 pts, out of them 53 from living donor
  - altogether 11,196 pts in RRT program, i.e. 1066 PMP

Numbers of dialysis units

103 DS pro dospělé a 3 DS pro děti (Brno FDN, Ostrava Poruba, Praha Motol)
3 DS pouze akutní program (nem. Havířov, Praha 10 FNKV II.int., Praha 5 MJ Motol)
3 DS pouze peritoneální program (Praha 10 FNKV I.int., Praha 5 FN Motol Int., Rumburk)
Numbers of hemopurification treatments

Počty výkonů v r. 2015:

- HD: 255,736 (z toho akut. 9%)
- PF: 1,632
- HDF: 646,259 (= 70% ze všech)
- HP: 0
- HF: 969
- jiné: 241
Number of treated patients (prevalence) on 31.12. according to RRT method

Number of patients on 31.12.2015:  
HD: 6203 pac.  
PD: 465 pac.(6,9%)  
TPL: 4526 pac.(on 31.12.2014)
Number of prevalent patients in PD (on 31. 12.)

- 2001: 315
- 2002: 313
- 2003: 319
- 2004: 339
- 2005: 349
- 2006: 358
- 2007: 402
- 2008: 462
- 2009: 460
- 2010: 498
- 2011: 501
- 2012: 489
- 2013: 518
- 2014: 431
- 2015: 465
Incident patients starting dialysis treatment (early vs. late referrals HD and PD)

pts/1 mil. pop.(PMP)
Changes in patients number treated by chronic HD
(during 2015 period on hemodialysis registered total 8176 pts)

2015: surviving on 31.12.: 6203    dead: 1493    transplanted: 290
Patients older than 60-yrs and diabetics in HD
(n=5965 pts)
Patients age groups in HD

(n=5965 pac.)
Patients age groups in PD

(n=454 pac.)
Dialysis units (n=15) according to PD patients 2015 (n >= 10 pac.)

- Praha Nusle: 10 patients
- Liberec: 10 patients
- Chrudim: 11 patients
- Třebíč: 12 patients
- Praha FNKV: 13 patients
- Rumburk: 13 patients
- Olomouc FN: 14 patients
- Ústí n.L.: 15 patients
- Slavkov: 15 patients
- Praha Strahov: 15 patients
- Sokolov: 21 patients
- Brno FNuSA: 21 patients
- Plzeň FN: 24 patients
- Praha IKEM: 29 patients
- Praha VFN: 30 patients
Percentage of patients in dialysis treatment up to 3-yrs
2015: physicians total: 269, certified in nephrology: 210 (78%) = 20.0 PMP
number of pts on chronic dialysis th per one nephrologists: 37
2015: Nurses total: 1413, certified in nephrology 765 (54%)
number of treatments per 1 nurse: 689
Number of dialysis beds and dialysis monitors

2015: dialyzačních lůžek: celkem 1536
chronických 1486
akutních 50

Dialyzační monitory: celkem 2088
z toho < 5 let 832
ESA treatment
percentage of treated patients according to treatment modality

HD: treated 4553 pac. (73%), mean dosage 5787 j./pac./týden
PD: treated 256 pac. (55%), mean dosage 4626 j./pac./týden
predialysis out-pts.: treated 918 pac.

přepočet k epoetinu: darbepoetin 1:200, Mircera 1:250

kadaver donors

living donors

- 2007: 34
- 2008: 29
- 2009: 27
- 2010: 17
- 2011: 40
- 2012: 72
- 2013: 83
- 2014: 63
- 2015: 53
Mean waiting time (days) for different organ transplantation (2006 – 2015)
Registry of Dialysis Patients:

Selected examples of 2015 data – reviews based on individual patient’s data reporting
RDP: status and principles

- established 2005 as a project of CNS
- voluntary data report
- financially supported and owned only by CNS
- based on individual patient data report
- fully registered by state authorities
- data report quarterly (trends)
- data transfer only electronically, own protected network
Regularly reported data

A/ 1x yearly - Data on dialysis centre
- Centre - technical data: type (state-owned / private); number of dialysis stations (total, out of those acute), number of shifts per week
- Medical equipment: dialysis monitors (numbers, on-line data collection from monitors),
  - water treatment (methods of treatment, disinfection frequency, frequency quality tests specified limits)
- Staff: Number of physicians, nurses, technicians, and others

B/ 4x yearly - database of the RDP-patients updated – 81% of all patients were registered on 31.12.2015
- Identification (encrypted): First name, Name, ID, Dial. Centre, Insurance company
- Base data: age, gender, primary dg. (cause of kidney failure, date of diagnosis), other dg. (at RRT start), vaccination (type, date), date of the RRT start and the 1st method used
- Vascular access (at RRT start): type, localisation, date of creation, date of failure
- Residual renal function (at RRT start): residual diuresis, eGFR
- Termination of treatment: date, reason

C/ 4x yearly- follow-up data of current patients
- Update of patient’s basic data insurance company, new/other dg., parent dialysis centre, vascular access, vaccination
  - Current quarterly data:
    - HD: number of HD per week and dialysis time, prescribed QB, dialyzer (hf/lf, membrane material, surface area), urea1, 2, 3, eKt/V, PCR
    - PD: mode, cycler (yes/no), total exchanged volume (l per 24 hours), dialysate type, weekly creat. clearance, Kt/V-PD
    - Pharm. treatment: EPO (yes/no, weekly dose), antihypertensives, phosphate binders, vit.D, hypolipidemics,
    - Biochemical data: Ca, P, PTH, Htc, Hb, HBSAg, HCV, HIV
Dialysis units – full reports

Celkový počet HDS v ČR: 102
z toho s RDP komunikuje 58 HDS (57%)
Celkový počet HD a PD pacientů v ČR (ke 31.12.13): 6310
z toho v RDP evidováno 4000 (65%)
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Dialysis units – irregular/no reports

- nepřispívající střediska
Breweries in CR....
Following data and outcomes of RDP are available:

   - the same as Yearbook, but based on individual data reports

B/ back-report: dialysis unit data comparison to the mean values of the CR
   - only for private access

C/ other statistics – specific data

Newly open 2016 – with identification of each dialysis unit:

D/ interactive graphics – basic lab values

E/ waiting list and Tx data
A/ On-line data RDP

- currently 11 parameters are displayed routinely
- in principle, all combinations of all registered parameters are available
Registry of dialysis patients – home page: www.nefro.cz
RDP – data collection

Contributing centres

- Patients
- Treatment evaluation
- Mortality
- Cumulative survival
- Vascular access
- Comorbidities
- Histogram of mean values

CONTRIBUTING CENTRES

Number of contributing centres

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</thead>
<tbody>
<tr>
<td></td>
<td>68</td>
<td>65</td>
<td>68</td>
<td>86</td>
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</tbody>
</table>
Numbers of registered patients

Active patients = patients with data from at least one of the last two quarters.
Age distribution of the patients

Males

- Others: 14.44%
- 80 - 90: 14.75%
- 70 - 80: 26.79%
- 60 - 70: 24.47%
- 50 - 60: 13.24%

Females

- Others: 13.99%
- 60 - 70: 21.21%
- 70 - 80: 31.46%
- 50 - 60: 8.87%
- 80 - 90: 14.75%

Analysis performed for 3102 females and 4523 males registered at the end of 4/2015 quarter
data on-line RDP – **primary renal disease** (using ICD 10)
total 6,412 pts registered in 12/2015

dg:
N119-TIN-PN
N180-CHRI n.s.
E112-diabetic nephropathy
N189-CHRS n.s.
I120-ICHL
N083-KSW
Q612-PCHL
E117-diab.nephropathy
N118-TIN other
N039-chron.GN

DN-total 19.7%
Primary renal disease (PRD)

PRD reported in 8146 patients

- Diabetes mellitus 27,0 %
- NDRD 7,3 %
- diabetic glomerulosklerosis 19,7 %
- Glomerulonefritidy 19,3 %
- CKD neurčená 18,4 % (!)
- Vascular nephrosclerosis 12,1%
- TIN 11,6%
- PKD 5,8%
N = 5887 pts
AVF  67.9 %
AVG  11.0 %
CVC  21.1 %

Vascular access (VA) counts according to type

AV fistula / UE-right 21.91%
AV fistula / Other 20.18%
AV-A.R./V.C. / UE-right 12.54%
AV-A.B./V.C. / UE-right 4.13%
Cannula / V. Jugul. Left 3.43%
Cannula / V. Jugul. Right 17.62%
AV fistula / UE-left 5.76%
Others 11.01%

Data filled-in for 5887 patients registered at the end of 4/2015 quarter
Prescribed blood flow $Q_b$ [ml/min]

Shown anonymous data of 47 centers
Serum Phosphates [mmol/l]

Country average

Shown anonymous data of 85 centers
B/ Back-report: dialysis unit data comparison to the mean values of the CR

- data accessible only for each single dialysis unit (privat area)
- data base structure identical as national
C/ Other statistics and data evaluation

• Mortality

• Survival

• Ca-P-PTH metabolismus
Died patients - distribution according to RRT duration (years)

Males
- 0 - 1: 25.59%
- 1 - 2: 17.39%
- 2 - 3: 12.21%
- 3 - 4: 9.87%
- 4 - 5: 9.03%
- 5 - 6: 7.86%
- 6 - 7: 4.85%
- Others: 13.21%

Females
- 0 - 1: 26.57%
- 1 - 2: 15.94%
- 2 - 3: 11.59%
- 3 - 4: 12.32%
- 4 - 5: 5.31%
- 5 - 6: 6.28%
- 6 - 7: 5.31%
- Others: 15.46%

Analysis performed for 414 females and 598 males registered at the end of 4/2015 quarter.
Died patients - distribution according to P

Data filled-in for 567 patients registered at the end of 4/2015 quarter

Died patients - distribution according to Hb

Data filled-in for 548 patients registered at the end of 4/2015 quarter

No. of pts: 567
Cumulative survival (acc. to Kaplan-Meier)

Diabetics
Non-diabetics

Plot created for the period 1.1.2008 - 31.3.2016, included 4039 / 5382 patients, who started their RRT during that period.
Ca-P-PTH data
n=4402 pts
Ca-P-PTH data
n=4402 pts

<table>
<thead>
<tr>
<th>Pi</th>
<th>Ca &lt; 2.1</th>
<th>Ca 2.1 - 2.4</th>
<th>Ca &gt; 2.4</th>
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</thead>
<tbody>
<tr>
<td>&lt; 1.13</td>
<td>730 / 16.6%</td>
<td>498 / 11.3%</td>
<td>101 / 2.3%</td>
</tr>
<tr>
<td>1.13 - 1.78</td>
<td>2407 / 54.7%</td>
<td>1602 / 36.4%</td>
<td>445 / 10.1%</td>
</tr>
<tr>
<td>&gt; 1.78</td>
<td>1265 / 28.7%</td>
<td>726 / 16.5%</td>
<td>275 / 6.2%</td>
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Analysis was performed for 4402 pts.
<table>
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<th>Ca 2.1 - 2.4</th>
<th>Ca &gt; 2.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1.13</td>
<td>131 / 3%</td>
<td>66 / 1.5%</td>
<td>42 / 1%</td>
<td>730 / 16.6%</td>
<td>498 / 11.3%</td>
<td>258 / 5.9%</td>
<td>182 / 4.1%</td>
<td>58 / 1.3%</td>
<td></td>
</tr>
<tr>
<td>1.13 - 1.78</td>
<td>360 / 8.2%</td>
<td>128 / 2.9%</td>
<td>135 / 3.1%</td>
<td>2407 / 54.7%</td>
<td>1602 / 36.4%</td>
<td>568 / 12.9%</td>
<td>611 / 13.9%</td>
<td>423 / 9.6%</td>
<td></td>
</tr>
<tr>
<td>&gt; 1.78</td>
<td>284 / 6%</td>
<td>62 / 1.4%</td>
<td>88 / 2%</td>
<td>1265 / 28.7%</td>
<td>726 / 16.5%</td>
<td>188 / 4.2%</td>
<td>248 / 5.6%</td>
<td>292 / 6.6%</td>
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</tr>
</tbody>
</table>

Analysis was performed for 4402 patients and data from the interval of 1/2015 - 4/2015 quarter.
D/ interactive graphics – basic lab values

E/ waiting list and Tx data

- we have opened data for public with identification of each dialysis unit

- in collaboration with Tx Registry
Interactive graphics display:

- percentage of pts fulfilling recommended interval in last year
- mean value of selected parameter in last year
- percentage of pts fulfilling recommended interval in selected period
- mean value of selected parameter in selected period
- standart deviations of all values
Interactive graphics according to dialysis units:

HB - PROCENTO PACIENTŮ PLNÍCICH DOPORUCENOU HODNOTU

POUŽITA DATA 4684 PACIENTŮ ZE 81 STŘEDISEK
NÁRODNÍ PRŮMĚR 61%
Interactive graphics according to lab value:
Interactive graphics – in detail:

HB - procento pacientů plnících doporučenou hodnotu

POUŽÍTÁ DATA 4684 PACIENTŮ ZE 81 STŘEDESEK
NÁRODNÍ PRŮMĚR 61%

HDS24 - Karlovy Vary
(82 / 65) (počet pac. / průměrný věk)

Hb - procento pacientů plnících doporučenou hodnotu 70%
Tx + WL data – in detail

**TX - WL - ABS. ČÍSLA**

![Bar chart showing ALIVE, HD_TRA, WL_IN, WL_TEMP_OUT categories with data for years 2014 and 2015.]

**HDS57 - Praha 8 - Bulovka**

<table>
<thead>
<tr>
<th>Category</th>
<th>2014</th>
<th>2015</th>
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<tr>
<td>ALIVE</td>
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<td>93</td>
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<td>HD_TRA</td>
<td>5</td>
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<td>WL_IN</td>
<td>8</td>
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<tr>
<td>WL_TEMP_OUT</td>
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</tr>
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</table>
Summary 1

- RDP
  - high quality data available
  - fully comparable with other European registries
  - certainly one of the most detailed Registry

- What is better?
  - frequency of data delivery (trends)
  - extend of data (and is possible further enlarged)
  - economy (cheaper)

- What is worse?
  - coverage (80% of the Czech population)
  - still low publication outputs
  - not yet individual data delivery for ERA Registry
GOALS and TARGETS:

• 100% coverage in individual data reporting
• on-going research and scientific outputs (survival, PRDs, diabetic pts, seniors, PKD pts, treatment of Ca-P-PTH, waiting list
• regular report to ERA-EDTA Registry
• merging with Tx Registry ⇒ RRT Registry of Czechia
Thank you for your attention

Ivan has a fun today, he is talking about RDP

www.nefro.cz