NATIONAL AUSTRIAN PTCA REGISTRY 1998

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BACKGROUND A complete and controlled National Database, wide open for audit, is the prerequisite for quality control, quality management and improvement.

METHOD:

In Austria we are comparing invasive (coronary angiography) and interventional (PTCA) outcome from year to year and from region to region since the year 1990. At the same time we perform monitor visits (audit) and participate in the European Data collection.

RESULTS:

31.419 diagnostic coronary angiographies (CA) and 8.559 PTCA were done in 27 adult-centers (22 of them perform PTCA) in Austria during the year 1998.

This is an increase of 5.4 % concerning coronary angiography and a 11.1% increase in PTCA compared to 1997. 70 % of PTCA (concerning only those centers, who report) were done during the diagnostic study (CA), direct PTCA for ongoing infarction was performed in 5.5%. In 5.838 cases stents (68 % of the PTCA cases) were implanted. International comparison shows Austria under the top nations with 3927 CA and 1070 PTCA per one million inhabitants. The consequence of PTCA plus Coronary artery bypass Surgery per 100 diagnostic cases is 39% .

Hospital mortality after PTCA was 0.5 %, emergency bypass surgery rate after PTCA 0,15 % and a myocardial infarction due to PTCA in the cath-lab occurred in 0.9 %. Mortality after emergency Surgery due to failed PTCA rose from 3,3% over 8,3% and 18,3% to 28,6% during the years 1993 to 1996 and declined to 8,3% in 1997 and 15.4% (2/13 cases) in 1998.

Out of 22 centers with PTCA-activity during 1998, ischemia before PTCA was reported in 3.644 patients in 15 centers, primary-success-rate in 18 centers concerning 6.390 patients and a controlling exercise stress test within 3 months after PTCA in 9 centers for 1.524 patients. The culprit lesion was a Type B lesion in 34% in the year 1996 and in 37% in the year 1997 and in 47% in 1998, at the same time Type C lesions increased to 24%.

The mean case load for all the 141 physicians, performing coronary angiography in 1998, was 222 per year, concerning the 81 PTCA-physicians the mean case load was 106 per year. Physicians with over the average results affirm investigation of case load.

CONCLUSION:

Austria seems to be one of the nations world-wide to support a complete national database with controlled numbers and parameters since years, including monitor visits (audits) and feedback reports. We reached continuos quality improvement concerning lower mortality at a higher ratio of interventional (PTCA) per diagnostic procedures in a more severe setting. This does not mean that the one is the consequence of the other.

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Audit, Quality Control, Quality Management, Interventional Cardiology, PTCA

Introduction:

To compare quantitative numbers and some distinct qualitative items from one year to another and between different countries the European Society of Cardiology conducts a registry (1,2,3). Concerning Invasive and Interventional Cardiology Austria has contributed to this registry since the year 1992 not only complete numbers of all the Austrian Catheterization-Laboratories (Cath-Labs), but has also performed a controlling-procedure including monitor visits (4-13). Austria is a Country with additional experience in an audit-procedure by complete monitor visits since 1992-1998 (14).

Austria follows a Minimal Basic Invasive/Interventional Data Set on the basis of the existing Data Set of the Working Group Coronary Circulation of the European Society of Cardiology, published for Switzerland and Europe (1,2,15,16,17,18). Countries like Denmark, Sweden, Switzerland and The Netherlands have existing and complete National Data Bases similar or almost identical to the promoted European Data Set.

This paper is a summary of the seventh annual survey on cardiac interventions in Austria since 1992. The data for the year 1998 are the main focus of the paper. Where essential for calculation of growth rates and purposes of comparison, data from the previous survey period 1992-1997 have been included. The latest monitor visits took place from February 18th to June 5th 1998.

Method

The exact and intense prescription of the historical beginning and conduction of our register has been published elsewhere (4-13). Briefly in the year 1992 the authors and the former president of the Austrian Society of Cardiology and the chairman of the Working Group Coronary Intervention started with the promotion of monitor visits in Austrian Cath Labs and published the first data (4,5). Definition of data and parameters is identical to the questionnaire of the European statistics (1,17). "New Devices", like stenting are defined as subgroup of PTCA.

26 Adult- and 4 Pediatric Centers were visited in 1998. There is one single center in Austria, which was not visited, since they started in autumn of 1998. 22 centers perform Coronary Angiography as well as PTCA, and 5 centers performed only Coronary Angiography in 1998. These centers include all the Austrian activities in valvuloplasty and electrophysiologic ablation as well.

The four pediadric centers are located in the three University Hospitals in Vienna, Graz and Innsbruck and an additional center is located in Linz. Seven of 27 adult centers are in Vienna and all of them perform PTCA as well. In Vienna there are two sites, where emergency coronary bypass operations can be performed, in Linz one Heart Surgery covers three centers. Großgmain, Krems and Villach are close to the next cities with Surgery (Salzburg, St.Pölten and Klagenfurt) and Feldkirch is supported by Helicopter. All the other PTCA Centers have surgery in the same house. One cardiac center performs angioplasty of the carotid artery as well.

The four authors and until the year 1995 also J.Mlczoch, instead of F.Leisch, have been visiting all the Austrian centers every year, with no exception.

At the beginning of each year the head of each Cath-Lab is asked to invite the monitor of ***our*** choice to synchronize his time table with the center.

During the years 1990-1992 in a first attempt of quality control we experienced, that hardly any Austrian Cath-Lab kept a complication book. In the meantime we can rely upon internal quality control in each Cath-Lab, so that the number of cases and complications within the Cath-Lab is documented in a special book or a database.

Concerning completeness, overall numbers of PTCA, diagnostic procedures, complications, like death and emergency surgery, and numbers of new devices, are documented very carefully. Comparison from year to year by different monitors shows a high confidence in these parameters.

The questionnaire of the European Society is the basis of our Austrian activity. The First Registry Conference, held at the European Heart House in June 26-27th 1997 promoted the Minimal Basic Invasive/Interventional Data Set on the basis of the existing Data Set of the Working Group Coronary Circulation, published 1996 by Bernhard Meier for the following years (1,16,17). An additional Austrian questionnaire, concerning diagnostic procedures and parameters, concerning the monitor visits, is added (9,10).

All data and information are treated confidential. We do not publish any numbers or characteristics of a single center. Only pooled data are published and internal revision of the centers is the way to compare pooled data with single center data.

The University Institute for Biostatistics and Documentation in Innsbruck (Head:Prof.Dr.Ing.Karl P.Pfeiffer) conducts all statistical work, beginning with the design of the questionnaire, ending with publication of diagrams via internet.

We ask each center for their opinion concerning our feedback report. Together with our report of the results a questionnaire is forwarded to each center, with the possibility to choose different types of feedback communication next year.

Publication policy is a feedback report to each center, concerning the pooled data in comparison to the single center data as fast as possible and pooled data official publication including the reactions of single centers (4-14). The primary feedback report has to be in German and the secondary release on the European level has to be in English (19).

Travel expenses for the monitors are refunded by the Austrian society of Cardiology, all the other costs of the documentation, statistics and publication are covered by the Innsbruck University or the authors themselves.

RESULTS:

The total number of Austrian centers, laboratories and activities in PTCA and coronary angiography is depicted in Table 1. This table is part of the annual European statistics. There was an increase in the number of PTCA-cases, ad hoc PTCA (incomplete data), stenting, diagnostic intracoronary ultrasound, intracoronary doppler, puncture site closing device, radial or brachial approach and use of glycoprotein IIb/IIIa antagonists from 1997 to 1998. There were 43 in-hospital deaths in Austria, due to PTCA in 1998. This is a decrease from 0,6 to 0,5% compared to 1997. The overall percentage of PTCA for ongoing infarction increased from 3.9% to 5,5% from 1997 to 1998.

Concerning the 278 patients without shock, during PTCA for acute MI, mortality was 2,5%, concerning the 63 patients with shock, during PTCA for acute MI, mortality was 27,0% in 1998. Table 2 is the Austrian part of the statistical analysis with special reference to coronary angiography, and PTCA, including additional complication parameters. There was an overproportional increase of 21.9% in left ventricular angiography from 1996 to 1997, whereas right heart catheterization at the time of angiography decreased by 4.2%. From 1997 to 1998 both decreased by 11,4% and 29,0% respectively. The risk of irreversible stroke in PTCA was 0.035% in 1998 and was 0,04% in diagnostic angiography in 1997.

Table 3 shows some further parameters, which are part of the European statistics. There was an increase in minimal invasive surgery, electrophysiologic diagnostics and ablations, and implantable defibrillators. Heart transplantation and myocardial biopsy decreased from 1996 to 1997 and increased again from 1997 to 1998. Surgical registries better refer to some of the data (11,20).

Table 5 and 6 show the comparison of the last years for Austria and Switzerland.

Austria shows a constant increase in the case load for angiography, PTCA, stent, and "ad hoc PTCA" during a diagnostic study, a fluctuation in frequency of PTCA for acute and ongoing infarction and in the ratio of emergency surgery mortality. But there was a constant decrease in the number of rotational atherectomy, and in the number of emergency bypass surgery due to failed PTCA and in the number of hospital mortality after PTCA. Constant from 1997 to 1998 is and the %-ratio of elective surgery and /or PTCA following diagnostic angiography and the number of complications concerning acute myocardial infarction in the catheterization laboratory.

Switzerland shows a steeper increase in the number of PTCA, of "ad hoc PTCA" during diagnostic study, of PTCA for acute or ongoing infarction, but no differences in the other parameters compared to Austria (15-18).

There was no problem in keeping the confidence regulations during 1997/1998.

During 1995-1998 frequencies of reported Ischemia, proven to be present before PTCA, and documented exercise stress tests before PTCA are constantly increasing, the number of reported controlling exercise stress tests within 3 months after PTCA does not increase. The distribution of the type of the stenosis to be treated (A,B,C) is shifting to a greater proportion of reported type B and C lesions, at the cost of fewer unreported types and constant rates of Type A lesions to be treated. (Table 4).

DISCUSSION:

The question of additional centers in Austria is still under discussion, and Table 1 as a part of the annual European statistic and Table 2 as the Austrian part of the statistical analysis seem to help Austrian health-care- and economy -authorities in planning further developments (21).

The mean case load for physicians in Austria, performing coronary angiography seems appropriate, but the plateau at approximately 200 cases could be larger.

Concerning PTCA the mean case load also is satisfying, but the range between maximum and minimum is very big. The situation for stents, or other new devices is similar to PTCA. It is not surprising, that physicians affirming investigation of case load perform 44% more angiographies, 62% more PTCA and 43% more New Devices compared to the average range. There is a broad but not conclusive opinion on case load and outcome in this context in the international literature (22-26). So the national discussion also will continue next year.

The coronary angiography case load per center in Austria shows us the possible future development in the direction of a plateau at 1000 or 1500 cases per center (table) and year. In this context it would be better in the future to calculate cases per angiography table or room, not per center. The same is true for PTCA. The percentage of PTCA in relation to diagnostic angiography shows, that in general the number of PTCA seems to be dependent more on the number of referred cases, than on the number of local "primary" diagnostic angiographies. The percentage of implanted stents is a good example for the chance to observe a development from linear distribution (from the lowest to the highest case load center) in 1996 to a more plateau profile in 1998, showing how centers – independent of each other – started to develop a more uniform stent-ratio profile in Austria until the year 1998. In the international literature angiography volume and outcome (27,28), overuse of procedures (29,30), appropriateness and performance (31-33) are detected as sources for guidelines development (34), which is also one of our Austrian main targets.

"Ad hoc PTCA" during diagnostic study seems to occur more frequent from year to year, in Austria and Switzerland, in a range between 50 and 70% of the PTCA-cases, but it becomes increasing difficult to report these numbers.

PTCA for acute or ongoing infarction shows a very inhomogeneous distribution within the last years in Austria, there is no clear trend to be seen, also in the literature there a mainly local reports (35).

Two thirds of the Austrian centers had to perform emergency bypass surgery due to failed PTCA during 1997, and one third during 1998, which is a very interesting observation, interpretation has to be done very cautious (21). Fluctuations, concerning PTCA mortality (including emergency surgery mortality) within centers, years and regions, seem dependent on the number of acute and emergency cases, but on the other hand side, there is a very constant all-over-mortality in Austria and Switzerland since years, suggesting a kind of "target mortality" of 0.5%.

There is only one private center in Austria (27). Possibly related to the higher percentage of private centers in Switzerland (15-18), there is still a steeper increase in the number of PTCA, of "ad hoc PTCA" during diagnostic study and of PTCA for acute or ongoing infarction in Switzerland, suggesting a more aggressive strategy.

Austrian Centers 1998/99:

1. Klagenfurt, Landeskrankenhaus, Innere Medizin II
2. Wien, Universitätsklinik, Kardiologie, Innere Medizin II
3. Linz, Krankenhaus der Elisabethinen, Innere Medizin
4. Graz, Universitätsklinik, Kardiologie, Innere Medizin
5. Graz, Universitätsklinik, Kinderkardiologie
6. Wien, Krankenhaus der Stadt Wien-Lainz, Kardiologie, Innere Medizin

7. Bad Schallerbach, Rehabilitationszentrum
8. Graz, Universitätsklinik, Innere Medizin II
9. Linz, AKH, Innere Medizin I
10. Villach (Beginn mit 1.1. 1996)
11. Wien, Krankenhaus Rudolfstiftung, Innere Medizin
12. Feldkirch, Landeskrankenhaus, Innere Medizin
13. Wien, Hanusch-Krankenhaus, Innere Medizin
14. Wien, Privatklinik Josefstadt, Kardiologie und Innere Medizin
15. Großgmain, Rehabilitationszentrum
16. Bad Ischl, Rehabilitationszentrum
17. Hochegg-Grimmenstein, Rehabilitationszentrum
18. Salzburg, Landeskrankenhaus, Innere Medizin
19. Wien, Universitätsklinik, Kinderkardiologie
20. Wien, Wilhelminenspital, Innere Medizin und Kardiologie
21. Linz, Krankenhaus der Barmherzigen Schwestern, Innere Medizin
22. St.Radegund, Rehabilitationszentrum
23. Eisenstadt, Krankenhaus der Barmherzigen Brüder, Innere Medizin
24. Wels, Krankenhaus der Barmherzigen Schwestern, Innere Medizin
25. Krems, Krankenhaus der Stadt Krems, Innere Medizin
26. St.Pölten, Landeskrankenhaus, Innere Medizin
27. Innsbruck, Universitätsklinik, Innere Medizin, Kardiologie
28. Innsbruck, Kinderkardiologie
29. Wien, Donauspital, Innere Medizin.
30. Linz, Kinderkardiologie, AKH
31. Mistelbach, Krankenhaus, Innere Medizin

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