



CHAPTER 3: CLINICAL PRESENTATIONS & INVESTIGATIONS

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Patient's heart rate (HR) and blood pressure were recorded at the beginning of the procedure. For all patients over the years 2007 to 2009, the mean heart rate was 72 (SD 16) beats per minute, mean systolic blood pressure (SBP) was 138 mm Hg (SD 26), and mean diastolic blood pressure (DBP) was 77 mm Hg (SD 13) (Table 3.1).

Thrombolysis in myocardial infarction (TIMI) risk index is derived from age, heart rate and SBP, i.e. $TIMI\ risk\ index = [HR \times (age/10)^2]/SBP$. The three strata of risk categories are: low (<30), intermediate (30-70) and high (>70). This simple risk index provides important information about mortality in patients with acute coronary syndrome (ACS). The majority of cases in this cohort (93%) had low TIMI risk index (<30) (Table 3.1).

Eighty-seven percent of patients were in sinus rhythm; atrial fibrillation was noted in 1% of cases. New York Heart Association (NYHA) classes for the cohort were as follows: class I, 68%; class II, 25%; class III, 2% and class IV, 0.7%. Canadian Cardiology Society Score (CCS) for the cohort were class I, 36%; class II, 39%; class III, 5% and class IV, 3%.

Mean left ventricular ejection fraction was 52% (SD 13) and 46% of all patients had EF $\geq$ 55% at the time of procedure (Table 3.1).

44% of all patients had a history of ACS and among those, 52% were ST-elevation myocardial infarction (STEMI), 38% were non-ST-elevation myocardial infarction (NSTEMI) about 10% were unstable angina (UA) patients. Among the STEMI patients, 54% were anterior MI (Table 3.1).

Time-to-treatment analysis of STEMI patients revealed a median symptom-to-door time of 120 minutes, median door-to-balloon time of 90 minutes and median transfer time of 180 minutes. About 50% all STEMI patients had door-to-balloon time less than 90 minutes (Table 3.1).

STEMI patients presented to non-cardiac centers had a median transfer-to-PCI time of 98 minutes. However, compared to STEMI without transfer, the door-to-balloon time was shorter (Table 3.2).

The above mentioned findings had an almost similar trend over three years.

Summary

1. The majority of patients (93%) undergoing PCI had low TIMI risk index (<30) at presentation.
2. 44% of all cases had a history of acute coronary syndrome, more than 50% of ACS was STEMI cases and more than 50% of STEMI were anterior MI.
3. Door-to-balloon time for STEMI was still higher than the recommended guidelines in many of the cases.

Table 3.1 Patient clinical status at time of PCI procedure, NCVD-PCI Registry, 2007-2009

	2007 Total No. of Procedures =3928		2008 Total No. of Procedures =3654		2009 Total No. of Procedures =3916		ALL Total No. of Procedures =11498	
	No.	%	No.	%	No.	%	No.	%
Clinical examination								
Heart rate at presentation, beats/minute								
N	3631		3174		3815		10620	
Mean(SD)	71 (16)		71 (16)		72 (16)		72 (16)	
Median, (min,max)	69 (25,181)		69 (26,193)		70 (32,167)		70 (25,193)	
Missing	297	8	480	13	101	3	878	8
Heart rate at presentation, beats/minute, No. (%)								
< 90	3185	88	2814	89	3299	86	9298	88
≥ 90	446	12	360	11	516	14	1322	12
Systolic blood pressure, mmHg								
N	3630		3147		3795		10572	
Mean(SD)	140 (26)		139 (27)		136 (25)		138 (26)	
Median, (min,max)	139 (62,227)		137 (60,230)		134 (60,230)		137 (60,230)	
Missing	298	8	507	14	121	3	926	8
Systolic blood pressure, mmHg, No. (%)								
< 90	45	1	43	1	42	1	130	1
≥ 90	3585	99	3104	99	3753	99	10442	99
Diastolic blood pressure, mmHg (n=3626)								
N	3633		3145		3797		10575	
Mean(SD)	77 (13)		77 (13)		77 (13)		77 (13)	
Median, (min,max)	78 (13,120)		78 (16,120)		78 (10,120)		78 (10,120)	
Missing	295	8	509	14	119	3	923	8
TIMI Risk Index (TRI)								
N	3533		3068		3778		10379	
Mean(SD)	17.00 (8.00)		17.00 (8.00)		18.00 (8.00)		18.00 (8.00)	
Median (min,max)	16 (3,90)		16 (4,87)		17 (3,77)		16 (3,90)	
Missing	395	11	586	19	138	4	1119	11
TRI Classification, No. (%)								
Low <30	3322	94	2863	93	3482	92	9667	93
Intermediate 30-70	205	6	202	7	294	8	701	7
High >70	6	0	3	0	2	0	11	0

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Baseline ECG, No. (%)								
Sinus rhythm	3358	85	3140	86	3495	89	9993	87
Atrial fibrillation	31	1	34	1	42	1	107	1
2 nd /3 rd AVB	21	1	22	1	22	1	65	1
LBBB	20	1	14	0	24	1	58	1
RBBB	22	1	26	1	43	1	91	1
NYHA, No. (%) (among patients with history of heart failure only)								
N	133	119	210	462	133	119	210	462
NYHA I	36	27.1	40	33.6	36	27.1	40	33.6
NYHA II	65	48.9	56	47.1	65	48.9	56	47.1
NYHA III	22	16.5	15	12.6	22	16.5	15	12.6
NYHA IV	5	3.8	8	6.7	5	3.8	8	6.7
Not Available	5	3.8	0	0	5	3.8	0	0
Functional Ischaemia, No. (%)								
Not Available	3024	77	2810	76.9	3089	78.9	8923	77.6
Positive	707	18	645	17.7	703	18	2055	17.9
Negative	50	1.3	104	2.8	66	1.7	220	1.9
Equivocal	31	0.8	46	1.3	35	0.9	112	1
Not Available	116	3	49	1.3	23	0.6	188	1.6
Canadian Cardiovascular Score (CCS), No. (%)								
CCS 1	1284	33	1034	28	1799	46	4117	36
CCS 2	1542	39	1720	47	1174	30	4436	39
CCS 3	184	5	196	5	157	4	537	5
CCS 4	130	3	96	3	87	2	313	3
Asymptomatic	267	7	487	13	600	15	1354	12
Not Available	521	13	121	3	99	3	741	6
Intra-Aortic Balloon Pump (IABP), No. (%)								
Yes	70	1.8	70	1.9	71	1.8	211	1.8
No	3777	96.2	3568	97.6	3825	97.7	11170	97.1
Not Available	81	2.1	16	0.4	20	0.5	117	1
Acute Coronary Syndrome, No. (%)								
Yes	1322	33.7	1389	38	2343	59.8	5054	44
No	2530	64.4	2263	61.9	1573	40.2	6366	55.4
Not Available	76	1.9	2	0.1	0	0	78	0.7

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	No.	%	No.	%	No.	%	No.	%
ACS Type, No. (%)								
STEMI	661	50	693	49.9	1274	54.4	2628	52
NSTEMI	496	37.5	581	41.8	820	35	1897	37.5
UA	147	11.1	104	7.5	242	10.3	493	9.8
Not Available	18	1.4	11	0.8	7	0.3	36	0.7
STEMI, No. (%)								
Anterior	342	56	354	56	732	60	1428	58
Non-Anterior	216	36	191	30	437	36	844	34
Not Available	48	8	88	14	46	4	182	7
Ejection Fraction (EF) Status,								
N	792		1236		2062		4090	
Mean (SD)	51(13)		52(14)		52(12)		52(13)	
Median (min,max)	53 (18,80)		53 (15,80)		52 (15,80)		53 (15,80)	
Not Available	3136	80	2418	66	1854	48	7408	65
Ejection Fraction (EF) Status, No. (%)								
< 30	42	5	72	6	68	3	182	4
30 - < 45	188	24	284	23	474	23	946	23
45 - ≤ 55	186	23	317	26	589	29	1092	27
≥ 55	376	47	563	46	931	45	1870	46
Killip Class, No. (%) (STEMI only)								
I	248	37.5	287	41.4	467	36.7	1002	38.1
II	59	8.9	61	8.8	462	36.3	582	22.1
III	17	2.6	11	1.6	33	2.6	61	2.3
IV	28	4.2	24	3.5	35	2.7	87	3.3
Not Applicable / Not Available	309	46.7	310	44.7	277	21.7	896	34.1
STEMI : Time-to-Treatment Analysis								
Symptom-to-door (min)								
N	56		41		32		129	
Mean (SD)	181(145)		147(151)		165(147)		167(147)	
Median (min,max)	128 (0,659)		113 (0,720)		123 (10,716)		120 (0,720)	
Not Available	605	92	652	94	1242	97	2499	95

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Door-to-Balloon (min)								
N	89		93		141		323	
Mean (SD)	129 (126)		144 (159)		130 (133)		134 (139)	
Median (min,max)	97 (0,868)		90 (7,870)		85 (0,842)		90 (0,870)	
Not Available	572	87	600	87	1133	89	2305	88
Door-to-Balloon (min), No. (%)								
< 90	40	45	46	49	75	53	161	50
≥ 90	49	55	47	51	66	47	162	50
Transfer Time								
N	57		39		39		135	
Mean (SD)	182(261)		179(212)		180(210)		180(232)	
Median (min,max)	75 (0,1260)		105 (0,840)		105 (0,855)		98 (0,1260)	
Not Available	604	91	654	94	1235	97	2493	95

Table 3.2 Time to treatment for STEMI, comparing patients with or without transfer, NCVD-PCI Registry, 2007

Year		With transfer				Without transfer			
		Mean	SD	Median	Min, Max	Mean	SD	Median	Min, Max
2007	N	48				8			
	Symptom- to -door (minutes)	176.7	150.6	121.5	(0, 659)	210.0	105.4	210.0	(33, 366)
	N	41				48			
	Door- to -balloon (minutes)	111.2	112.8	85.0	(0, 542)	143.3	136.4	112.5	(28, 868)
	N	57				-	-		
	Transfer- to-PCI centre (minutes)	181.6	260.8	75.0	(0, 1260)	-	-		
	N	37				47			
	Symptom- to-balloon (minutes)	419.9	200.5	400.0	(90, 806)	303.0	153.1	268.0	(84, 719)
2008	N	35				6			
	Symptom- to -door (minutes)	142.4	126.0	113.0	(0, 480)	177.3	269.4	88.0	(15, 720)
	N	31				62			
	Door- to -balloon (minutes)	107.7	155.1	60.0	(17, 680)	162.7	159.6	111.5	(7, 870)
	N	39				-	-		
	Transfer- to-PCI centre (minutes)	178.7	212.4	105.0	(0, 840)	-	-		
	N	29				53			
	Symptom- to-balloon (minutes)	358.7	209.3	330.0	(63, 868)	347.1	203.6	300.0	(32, 945)
2009	N	28				4			
	Symptom- to -door (minutes)	148.4	113.1	121.5	(10, 407)	281.5	297.3	167.5	(75, 716)
	N	31				110			
	Door- to -balloon (minutes)	128.4	170.2	70.0	(0, 842)	129.9	120.8	90.0	(6, 639)
	N	39				-	-		
	Transfer- to-PCI centre (minutes)	179.6	209.6	105.0	(0, 855)	-	-		
	N	26				95			
	Symptom- to-balloon (minutes)	366.9	252.3	261.0	(41, 967)	336.1	214.3	284.0	(36, 974)

Table 3.2 Time to treatment for STEMI, comparing patients with or without transfer, NCVD-PCI Registry, 2007

Year		With transfer				Without transfer			
		Mean	SD	Median	Min, Max	Mean	SD	Median	Min, Max
All	N	111				18			
	Symptom- to -door (minutes)	158.7	134.1	120.0	(0, 659)	215.0	207.5	151.0	(15, 720)
	N	103				220			
	Door- to -balloon (minutes)	115.3	143.7	72.0	(0, 842)	142.1	136.2	101.0	(6, 870)
	N	135				-	-		
	Transfer- to-PCI centre (minutes)	180.2	231.7	98.0	(0, 1260)	-	-		
	N	92				195			
	Symptom- to-balloon (minutes)	385.6	365.0	(41, 967)		331.1	198.0	285.0	(32, 974)

Table 3.3 Comparison of heart rate according to PCI status, NCVD-PCI Registry, 2007-2009

Year	Heart rate (beats/min)	Elective		NSTEMI/UA		AMI		Not Available	
		No.	%	No.	%	No.	%	No.	%
2007	≤60	626	18	26	14	18	10	2	18
	60-80	2018	57	88	46	59	32	6	55
	> 80-100	527	15	45	24	61	34	1	9
	>100	104	3	18	9	31	17	1	9
	Not Available	270	8	13	7	13	7	1	9
	Total	3545	100	190	100	182	100	11	100
2008	≤60	614	18	14	8	21	14	1	33
	60-80	1761	53	82	47	51	33	2	67
	> 80-100	416	13	44	25	39	25	0	0
	>100	82	2	13	8	34	22	0	0
	Not Available	450	14	20	12	10	6	0	0
	Total	3323	100	173	100	155	100	3	100
2009	≤60	649	19	22	13	16	7	4	25
	60-80	2042	58	81	50	83	34	8	50
	> 80-100	586	17	43	26	83	34	4	25
	>100	132	4	11	7	51	21	0	0
	Not Available	86	2	6	4	9	4	0	0
	Total	3495	100	163	100	242	100	16	100
All	≤60	1889	18	62	12	55	9	7	23
	60-80	5821	56	251	48	193	33	16	53
	> 80-100	1529	15	132	25	183	32	5	17
	>100	318	3	42	8	116	20	1	3
	Not Available	806	8	39	7	32	6	1	3
	Total	10363	100	526	100	579	100	30	100

Table 3.4 Comparison of heart rate according to ACS subtypes, NCVD-PCI Registry, 2007-2009

Year	Heart rate (beats/min)	STEMI		NSTEMI		UA		NA	
		No.	%	No.	%	No.	%	No.	%
2007	≤60	86	13	97	19.6	19	12.9	3	16.7
	60-80	335	50.7	261	52.6	80	54.4	9	50
	> 80-100	148	22.4	94	19	29	19.7	3	16.7
	>100	47	7.1	25	5	4	2.7	1	5.6
	Not Available	45	6.8	19	3.8	15	10.2	2	11.1
	Total	661	100	496	100	147	100	18	100
2008	≤60	92	13.3	108	18.6	13	12.5	3	27.3
	60-80	352	50.8	310	53.4	59	56.7	4	36.4
	> 80-100	129	18.6	108	18.6	19	18.3	1	9.1
	>100	59	8.5	26	4.5	4	3.8	0	0
	Not Available	61	8.8	29	5	9	8.7	3	27.3
	Total	693	100	581	100	104	100	11	100
2009	≤60	193	15.1	143	17.4	53	21.9	0	0
	60-80	693	54.4	463	56.5	132	54.5	3	42.9
	> 80-100	286	22.4	156	19	32	13.2	1	14.3
	>100	82	6.4	44	5.4	9	3.7	0	0
	Not Available	20	1.6	14	1.7	16	6.6	3	42.9
	Total	1274	100	820	100	242	100	7	100
All	≤60	371	14.1	348	18.3	85	17.2	6	16.7
	60-80	1380	52.5	1034	54.5	271	55	16	44.4
	> 80-100	563	21.4	358	18.9	80	16.2	5	13.9
	>100	188	7.2	95	5	17	3.4	1	2.8
	Not Available	126	4.8	62	3.3	40	8.1	8	22.2
	Total	2628	100	1897	100	493	100	36	100