

**CHAPTER 7**

**NUTRITIONAL STATUS  
ON DIALYSIS**

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**7.1: Serum Albumin Levels on Dialysis**

Table 7.1.1 indicates that mean serum albumin levels for HD patients for the years 1997 to 2004 were acceptable as they were above the criteria of increased mortality risk (<35g/L). The trend appears to be stabilizing at this level. Percentage of patients with serum albumin levels < 35g/L was between 11 to 18%. For the year 2004, mean serum albumin was 40 g/L which was just at the borderline of mortality risk (≥40g/L). Only 13% had values < 35 g/L compared to 54% at ≥ 40g/L.

**Table 7.1.1:** Distribution of serum Albumin (g/L), HD patients 1997-2004

Year	No. of subjects	Mean	SD	Median	LQ	UQ	% patients <30g/L	% patients 30-<35g/L	% patients 35-<40g/L	% patients ≥40g/L
1997	1644	40.9	6.2	41	37.7	44.3	3	8	30	59
1998	2075	41.2	6.5	41	37.5	44.7	3	9	28	59
1999	2755	39.7	6.1	39.7	36.3	43	4	13	35	49
2000	3734	38.6	7	39	36	42	5	11	41	43
2001	4666	39	5.6	38.5	36	41.8	3	15	44	38
2002	5568	39.2	5.6	39	36.5	42	3	12	42	43
2003	6529	39.9	5.4	40	37.3	42.5	3	9	35	52
2004	7511	40	5.2	40	37.3	42.8	3	10	34	54

Fig. 7.1.1 shows that there was some improvement in serum albumin levels from the years 1998 to 2004

**Figure 7.1.1:** Cumulative distribution of Albumin (g/L), HD patients 1997-2004

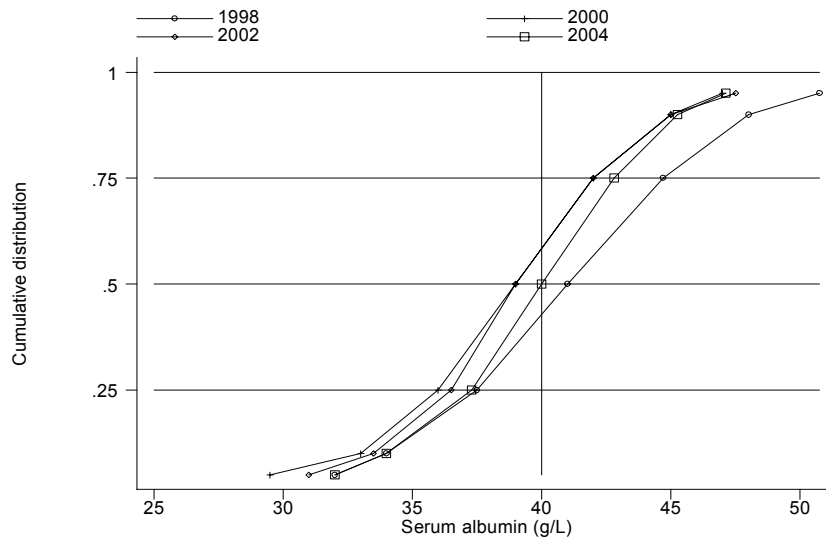


Table and figure 7.1.2 indicate that for CAPD patients, mean values for serum albumin levels each year from 1997 to 2004 showed a downward trend from 35.7 to 33 g/L indicating increasing mortality risk (<35g/L). Percentage of patients with serum albumin levels < 35g/L increased from 44% to 59%. One possible explanation for the above trend could be that as CAPD became widely available more elderly diabetic patients were included in the program. In 2004, the mean value was at 33g/L well below the level for increased mortality risk (35 g/L). Overall 59% of this population had values <35 g/L compared to only 11% with  $\geq 40$ g/L.

**Table 7.1.2:** Distribution of serum Albumin (g/L), CAPD patients 1997-2004

Year	No. of subjects	Mean	SD	Median	LQ	UQ	% patients <30g/L	% patients 30-<35g/L	% patients 35-<40g/L	% patients $\geq 40$ g/L
1997	471	35.7	6.8	35.7	31.5	39.5	16	28	34	22
1998	536	35.8	6.7	36	32	39.7	16	25	35	24
1999	597	34.1	6.6	34	30.8	38	21	33	32	14
2000	640	34.3	6.1	35	31	38.3	20	28	37	14
2001	750	33.3	6.2	33.6	29.3	37	27	33	28	12
2002	862	33.9	5.9	34.3	30.8	37.5	21	35	33	12
2003	1182	33.3	5.8	33.8	29.7	37.3	26	33	30	11
2004	1285	33	6	33.8	29.5	37.3	27	32	30	11

**Figure 7.1.2:** Cumulative distribution of Albumin (g/L), CAPD patients 1997-2004

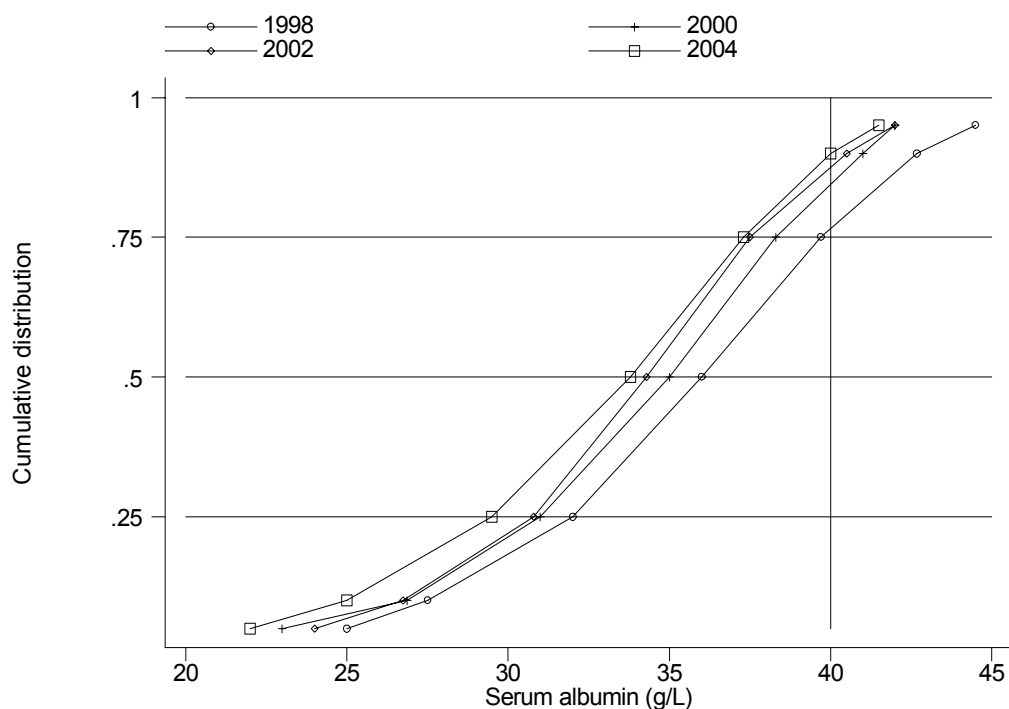


Table 7.1.3 indicates a J curve in the proportion of patients in HD centres with serum albumin  $\geq 40\text{g/L}$  from 1997 to 2004. This may be due to the increasing number of centers participating in collection of data for NRR since 2000. However there was a wide variation in serum albumin levels among dialysis centers with some centers reporting no patients with serum albumin above  $40\text{g/L}$ . Half the centers had 60% of patients with serum albumin  $>40\text{g/L}$  in 2004. The disparity among centers was still wide as the range was between 4 and 100%.

**Table 7.1.3:** Variation in Proportion of patients with serum albumin  $\geq 40\text{g/L}$  among HD centres 2004

Year	No. of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
1997	46	3	10	32	59.5	77	95	96
1998	45	9	14	31	59	80	95	97
1999	64	4	8	20	50.5	71	90	95
2000	92	0	3	21	39	62.5	84	98
2001	111	0	2	13	40	57	89	100
2002	132	0	7	21	43.5	62.5	83	100
2003	150	0	15	39	56.5	70	91	100
2004	182	4	10	36	60	74	88	100

Fig. 7.1.3 indicates the wide variation in the proportion of patients with serum albumin  $\geq 40\text{g/L}$  in the 182 HD centres for the year 2004.

**Figure 7.1.3:** Variation in Proportion of patients with serum albumin  $\geq 40\text{g/L}$ , HD centres 2004

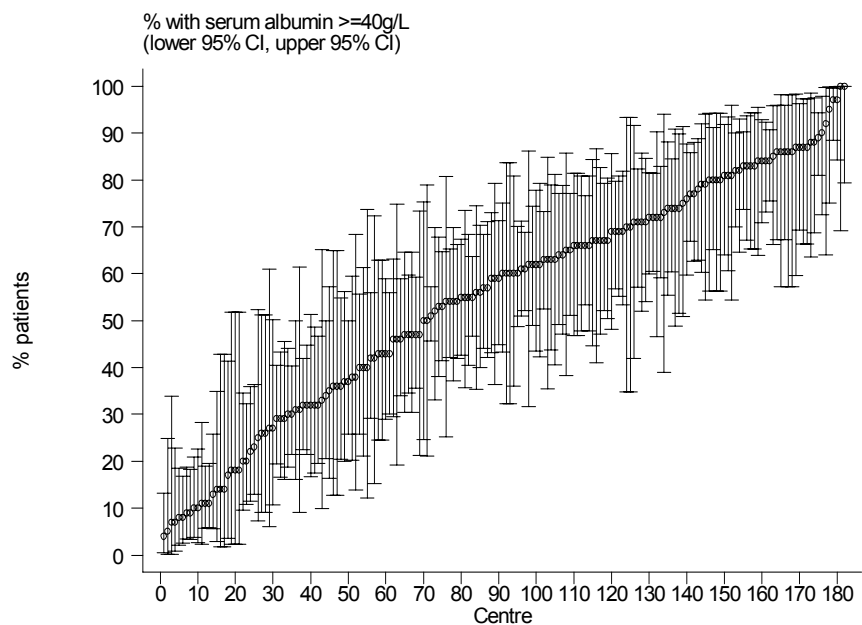


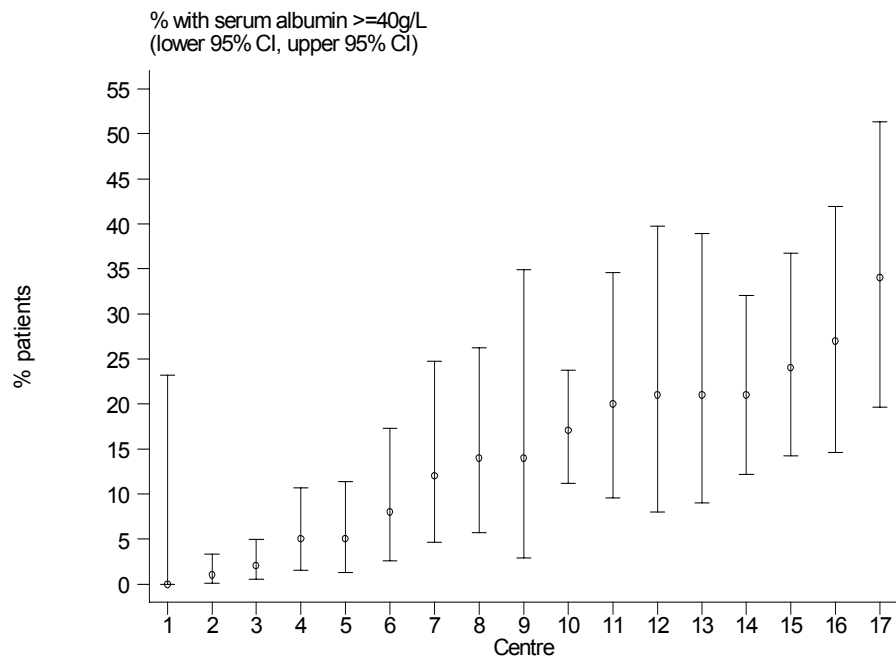
Table 7.1.4 indicates a decreasing trend in the proportion of patients with serum albumin  $\geq 40$ g/L from 1997 to 2004 among CAPD centres. A number of centers had no patients with serum albumin above 40g/L. The center with the highest proportion of patients with serum albumin  $> 40$  g/L only recorded a percentage of 34.

**Table 7.1.4:** Variation in Proportion of patients with serum albumin  $\geq 40$ g/L among CAPD centres 2004

Year	No. of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
1997	7	5	5	10	28	29	59	59
1998	9	0	0	7	19	35	36	36
1999	9	2	2	10	13	22	29	29
2000	11	0	0	5	17	28	42	42
2001	12	1	1	4	16.5	27.5	38	38
2002	14	4	4	6	10.5	16	35	35
2003	17	0	0	5	12	14	48	48
2004	17	0	0	5	14	21	34	34

Fig. 7.1.4 indicates the wide variation in proportion of patients with serum albumin  $\geq 40$ g/L among CAPD centres for the year 2004.

**Figure 7.1.4:** Variation in Proportion of patients with serum albumin  $\geq 40$ g/L, CAPD centres 2004



**7.2: Body Mass Index (BMI) on Dialysis**

Table 7.2.1 indicates a stable trend in mean BMI values in HD patients ranging from 23.2 to 24.3. Percentage of patients with BMI < 18.5 decreased from 19% in 1997 to 14% in 2004. Percentage of patients with BMI ≥25 increased from 20% in 1997 to 28% in 2004. For the year 2004, mean BMI value was 23.4. However 14% of this group had values <18.5 compared to 28% at ≥ 25.

**Table 7.2.1:** Distribution of BMI, HD patients 1997-2004

Year	No of subjects	Mean	SD	Median	LQ	UQ	% patients <18.5	% patients 18.5-25	% patients ≥25
1997	1542	23.8	17.2	21.5	19.1	24.3	19	61	20
1998	1978	24.3	19.4	21.6	19.1	24.3	19	60	21
1999	2704	23.7	17.1	21.4	19.2	24.4	18	61	21
2000	3839	23.1	12.8	21.6	19.3	24.5	18	60	22
2001	4520	23.1	12	21.9	19.3	24.7	18	59	23
2002	5032	23.3	11.7	22	19.5	24.9	16	59	24
2003	5902	23.2	10.8	22.1	19.5	25.1	16	58	26
2004	6639	23.4	9.9	22.4	19.8	25.4	14	58	28

Fig. 7.2.1 showing cumulative distribution indicates that there was an decreasing number of patients with BMI <25

**Figure 7.2.1:** Cumulative distribution of BMI, HD patients 1997-2004

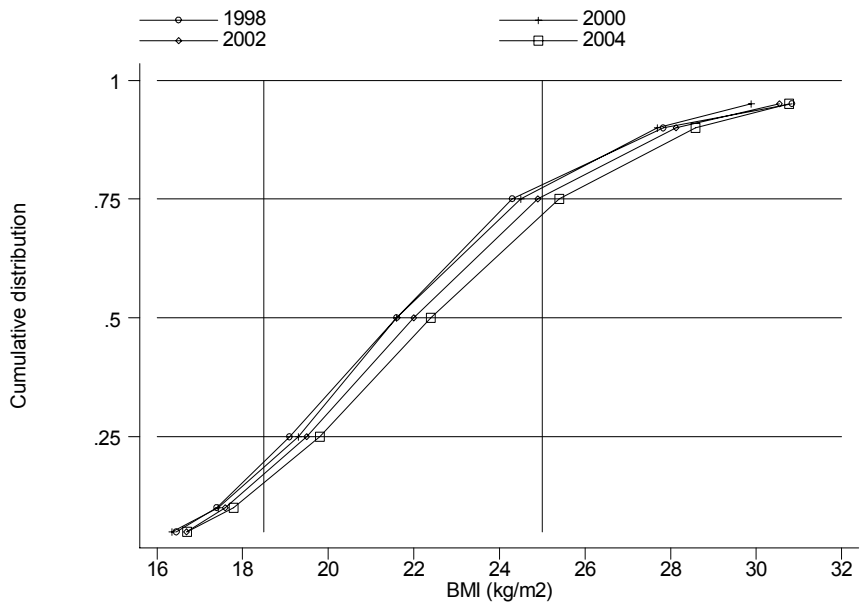


Table 7.2.2 indicates a stable trend in mean BMI values for PD patients ranging from 22.6 to 23.2. However the percentage of patients with BMI < 18.5 decreased from 21% in 1997 to 17% in 2004. Percentage of patients with BMI  $\geq 25$  increased from 23% in 1997 to 31% in 2004. For the year 2004 mean BMI value was 23.2. However 17% of this group had values <18.5 compared to 31% at  $\geq 25$ .

**Table 7.2.2:** Distribution of BMI, CAPD patients 1997-2004

Year	No of subjects	Mean	SD	Median	LQ	UQ	% patients <18.5	% patients 18.5-25	% patients $\geq 25$
1997	420	22.6	12.5	21.9	18.9	24.7	21	56	23
1998	491	22.1	11.1	21.3	18.7	24	22	57	20
1999	552	21.8	4.4	21.5	18.9	24.5	22	56	22
2000	602	21.7	4.4	21.5	18.6	24.6	25	53	22
2001	663	22.2	4.8	21.8	18.7	25.2	23	50	26
2002	750	22.4	4.8	22.1	18.8	25.5	23	48	30
2003	1064	23	6.8	22.6	19.2	25.8	19	51	30
2004	1167	23.2	7.1	22.6	19.5	26.1	17	51	31

Fig. 7.2.2 shows that overall the cumulative distribution data indicates a BMI <25 for an decreasing number of patients.

**Figure 7.2.2:** Cumulative distribution of BMI, CAPD patients 1997-2004

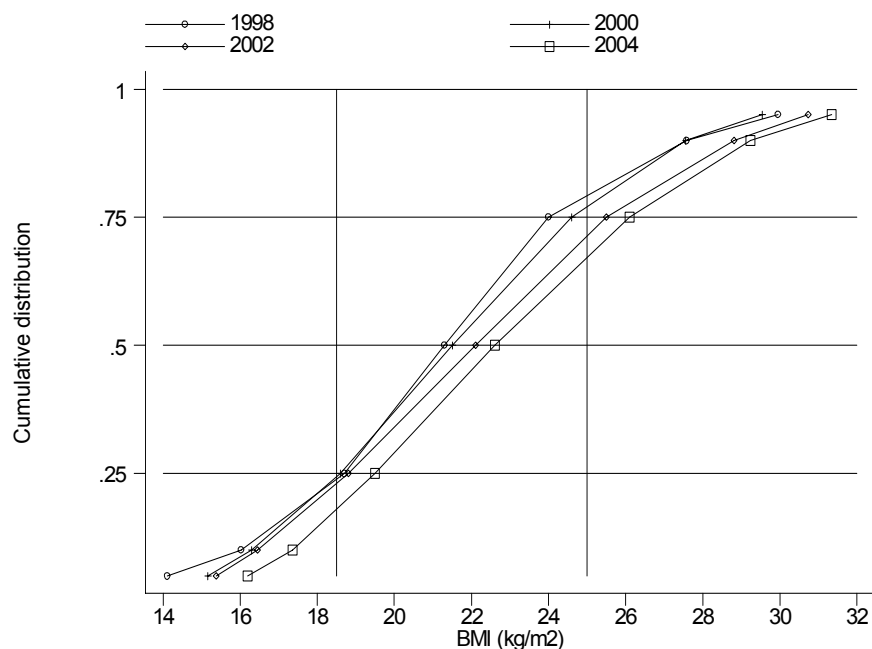


Table 7.2.3 indicates an increasing trend in the proportion of HD patients among centres with BMI  $\geq 25$  from 1997 to 2004.

**Table 7.2.3:** Variation in Proportion of patients with BMI  $\geq 18.5$  among HD centres 2004

Year	No. of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
1997	46	60	64	75	80.5	88	100	100
1998	45	63	68	76	80	85	96	96
1999	64	58	68	77	83	88.5	94	100
2000	94	59	69	78	83	88	95	100
2001	108	56	68	77	82	88	93	100
2002	123	60	69	77	84	89	100	100
2003	147	57	71	79	85	90	100	100
2004	171	61	70	81	86	90	100	100

Fig. 7.2.3 indicates the variation in proportion of patients with BMI  $\geq 18.5$  in 171 HD centers for the year 2004.

**Figure 7.2.3:** Variation in Proportion of patients with BMI  $\geq 18.5$ , HD centres 2004

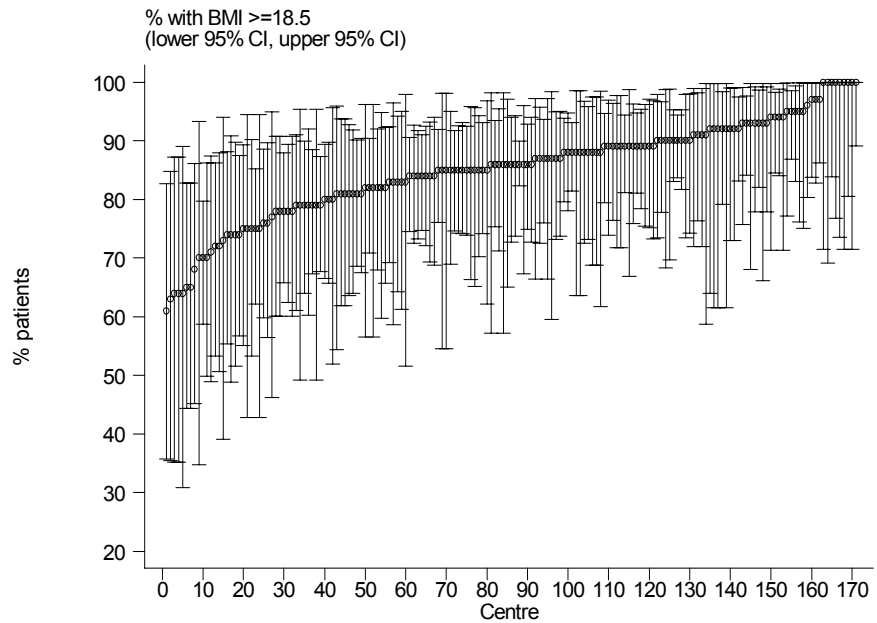


Table 7.2.4 indicates a stable trend in the proportion of CAPD patients with BMI  $\geq 25$  from 1997 to 2004.

**Table 7.2.4:** Variation in Proportion of patients with BMI  $\geq 18.5$  among CAPD centres 2004

Year	No. of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
1997	7	50	50	74	81	88	93	93
1998	9	15	15	78	89	91	100	100
1999	9	0	0	67	76	83	95	95
2000	11	13	13	71	76	88	89	89
2001	12	17	17	73	79	86.5	90	90
2002	14	32	32	74	81.5	84	92	92
2003	17	26	26	80	85	88	100	100
2004	17	41	41	76	86	89	95	95

Fig. 7.2.4 indicates the variation in the proportion of patients with BMI of  $> 18.5$  in the 17 CAPD centres varying from about 40% to 95%.

**Figure 7.2.4:** Variation in Proportion of patients with BMI  $\geq 18.5$ , CAPD centres 2004

