

1    **Supplementary materials**

2    **Title:** Newly-diagnosed diabetes and sustained hyperglycemia are associated with poorer outcomes in COVID-19 inpatients without pre-  
3    existing diabetes.

4    **Table S1.** Incidence for primary and secondary outcomes of patients in the NDD or non-NDD group.

5    **Table S2.** Incidence for primary and secondary outcomes of patients in the NDD or non-NDD group after PSM analysis.

6    **Table S3.** Characteristics of newly-diagnosed diabetes patients in sustained hyperglycemia group, fluctuant group, and remitted group.

7    **Table S4.** Characteristics of hypoglycemic agents (HA) users and nonusers of newly-diagnosed diabetes patients.

8    **Table S5.** Number of newly-diagnosed diabetes patients using insulin or insulin plus oral hypoglycemic agents.

9    **Table S6.** Number of newly-diagnosed diabetes patients using specific oral hypoglycemic agents.

10    **Table S7.** Death number in newly-diagnosed diabetes patients using specific hypoglycemic agents.

11    **Figure S1.** Kaplan-Meier curves for cumulative probability of COVID-19 mortality during hospitalization in NDD and Non-NDD patients before  
12    propensity score-matching. NDD, newly-diagnosed diabetes.

13    **Figure S2.** Dynamic profiles of blood glucose in fluctuant group, sustained hyperglycemia group, and remitted group in patients with newly-  
14    diagnosed diabetes during hospitalization.

15 **Table S1. Incidence for primary and secondary outcomes of patients in the NDD or non-NDD group.**

<b>Outcomes</b>	<b>Total (N=3114)</b>	<b>NDD (n=351)</b>	<b>non-NDD (n=2763)</b>	<b>P-value</b>
All-cause mortality	97(3.11%)	65(18.52%)	32(1.16%)	<0.001
ARDS	331(10.63%)	126(35.90%)	205(7.42%)	<0.001
Acute kidney injury	53(1.70%)	46(13.11%)	7(0.25%)	<0.001
Acute liver injury	210(6.74%)	53(15.10%)	157(5.68%)	<0.001
Acute heart injury	155(4.98%)	84(23.93%)	71(2.57%)	<0.001
Heart failure	352(11.30%)	116(33.05%)	236(8.54%)	<0.001

16 **Notes:**  $P < 0.05$  was considered significant.17 **Abbreviations:** NDD, newly-diagnosed diabetes; ARDS, acute respiratory distress syndrome.

18 **Table S2. Incidence for primary and secondary outcomes of patients in the NDD or non-NDD group after PSM analysis.**

Outcomes	Total (N=921)	NDD (n=307)	non-NDD (n=614)	P-value
All-cause mortality	51(5.54%)	30(9.77%)	21(3.42%)	<0.001
ARDS	169(18.35%)	86(28.01%)	83(13.52%)	<0.001
Acute kidney injury	23(2.50%)	20(6.51%)	3(0.49%)	<0.001
Acute liver injury	86(9.34%)	42(13.68%)	44(7.17%)	0.002
Acute heart injury	89(9.66%)	51(16.61%)	38(6.19%)	<0.001
Heart failure	188(20.41%)	77(25.08%)	111(18.08%)	0.016

19 **Notes:**  $P < 0.05$  was considered significant.20 **Abbreviations:** NDD, newly-diagnosed diabetes; ARDS, acute respiratory distress syndrome.

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**Table S3. Characteristics of newly-diagnosed diabetes patients in sustained hyperglycemia group, fluctuant group, and remitted group.**

Parameters	Sustained hyperglycemia (n = 39)	Fluctuant group (n = 190)	Remitted group (n = 51)	P-value
<b>Clinical characteristics on admission</b>				
Days from symptom to hospital, median(IQR)	11(7-23)	11(6-18)	10(6-14)	0.546
Age, median (IQR)	62(55-70)	63(54-68)	56(50-68)	0.077
Male gender, n(%)	18(46.15%)	115(60.53%)	21(41.18%)	0.023
Heart rate, median (IQR), bpm	84(79-99)	84(78-98)	85(76-95)	0.921
Respiratory rate, median (IQR), bpm	20(19-22)	20(19-22)	20(18-21)	0.665
DBP, median (IQR), mmHg	83(73-92)	80(71-88)	79(72-87)	0.190
SBP, median (IQR), mmHg	134(117-150)	129(120-140)	128(120-141)	0.630
Fever, n (%)	29(74.36%)	157(82.63%)	41(80.39%)	0.481
Cough, n (%)	29(74.36%)	130(68.42%)	33(64.71%)	0.618
Fatigue, n (%)	13(33.33%)	50(26.32%)	13(25.49%)	0.640
Dyspnea, n (%)	18(46.15%)	61(32.11%)	13(25.49%)	0.109
<b>Comorbidities on admission</b>				
COPD, n (%)	0(0.00%)	5(2.63%)	0(0.00%)	0.496
Cerebrovascular diseases, n (%)	0(0.00%)	11(5.79%)	0(0.00%)	0.088

Chronic liver disease, n (%)	0(0.00%)	9(4.74%)	1(1.96%)	0.476
Hypertension, n (%)	15(38.46%)	84(44.21%)	14(27.45%)	0.093
Coronary heart disease, n (%)	5(12.82%)	16(8.42%)	1(1.96%)	0.126
Chronic renal diseases, n (%)	1(2.56%)	15(7.89%)	0(0.00%)	0.053
<b>Chest CT on admission</b>				
Unilateral lesion, n (%)	2(5.13%)	17(8.95%)	3(5.88%)	0.706
Bilateral lesions, n (%)	28(71.79%)	159(83.68%)	45(88.24%)	0.106
<b>Laboratory examination on admission</b>				
Leukocyte count > 9.5, 10 <sup>9</sup> /L, n/N (%)	11/39(28.21%)	39/189(20.63%)	7/50(14.00%)	0.257
Neutrophil count > 6.3, 10 <sup>9</sup> /L, n/N (%)	15/39(38.46%)	54/189(28.57%)	12/50(24.00%)	0.315
C-reactive protein > ULN, n/N (%)	11/16(68.75%)	44/71(61.97%)	20/28(71.43%)	0.640
ALT > 40 U/L, n/N (%)	8/38(21.05%)	47/171(27.49%)	12/44(27.27%)	0.713
AST > 40 U/L, n/N (%)	12/38(31.58%)	48/171((28.07%)	15/44(34.09%)	0.709
Urea > ULN, n/N (%)	7/39(17.95%)	20/189(10.58%)	4/50(8.00%)	0.305
Creatinine > ULN, n/N (%)	5/39(12.82%)	21/189(11.11%)	3/50(6.00%)	0.527
Blood glucose, mmol/L, median (IQR)	11.08(8.29-13.85)	6.73(5.7-7.69)	8.41(7.53-9.60)	<0.001
LDL-c > ULN, n/N (%)	4/32(12.50%)	16/153(10.46%)	5/39(12.82%)	0.850
TC > ULN, n/N (%)	5/33(15.15%)	12/163(7.36%)	3/40(7.50%)	0.340

hs-CRP > ULN, n/N (%)	27/33(81.82%)	144/166(86.75%)	38/45(84.44%)	0.618
Procalcitonin > ULN, n/N (%)	17/36(47.22%)	93/159(58.49%)	15/42(35.71%)	0.024
D-dimer > ULN, n/N (%)	25/38(65.79%)	121/187(64.71%)	24/50(48.00%)	0.084
Lymphocyte count < 1.1, 10^9/L, n/N (%)	22/39(56.41%)	101/189(53.44%)	37/50(74.00%)	0.032
SpO2 ≤ 93%, n/N (%)	17/33(51.52%)	45/162(27.78%)	5/40(12.50%)	0.001

#### **Management during hospitalization**

Oxygen inhalation, n (%)	34(87.18%)	175(92.11%)	48(94.12%)	0.481
Immunoglobulin, n (%)	8(20.51%)	50(26.32%)	16(31.37%)	0.511
Invasive ventilation, n (%)	12(30.77%)	47(24.74%)	3(5.88%)	0.006
Noninvasive ventilation, n (%)	13(33.33%)	53(27.89%)	11(21.57%)	0.454
Renal replacement therapy, n (%)	2(5.13%)	10(5.26%)	1(1.96%)	0.681
ICU treatment, n (%)	13(33.33%)	56(29.47%)	2(3.92%)	<0.001
Antiviral drug, n (%)	18(46.15%)	78(41.05%)	27(52.94%)	0.301
Antibiotics drug, n (%)	13(33.33%)	76(40%)	23(45.10%)	0.529
Traditional Chinese medicine (%)	17(43.59%)	89(46.84%)	29(56.86%)	0.367
Anti-hypertensive drug, n (%)	8(20.51%)	53(27.89%)	11(21.57%)	0.476
Lipid-lowering drug, n (%)	3(7.69%)	17(8.95%)	2(3.92%)	0.620
Hypoglycemic drugs, n (%)	10(25.64%)	23(12.11%)	6(11.76%)	0.075

Vasoactive drug, n (%)	1(2.56%)	9(4.74%)	0(0.00%)	0.331
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23 **Notes:**  $P < 0.05$  was considered significant.

24 **Abbreviations:** IQR, interquartile range; bpm, beats per minute; DBP, diastolic blood pressure; SBP, systolic blood pressure; COPD, chronic  
25 obstructive pulmonary disease; CT, computed tomography; ULN, upper limit of normal; ALT, alanine aminotransferase; AST, aspartate  
26 aminotransferase ; LDL-c, low-density lipoprotein cholesterol; TC, total cholesterol; hs-CRP, high-sensitivity C-reactive protein; ICU, intensive care  
27 unit.

**Table S4. Characteristics of hypoglycemic agents (HA) users and nonusers of newly-diagnosed diabetes patients.**

Parameters	Non-users (296)	HA users (55)	P-value
<b>Clinical characteristics on admission</b>			
Days from symptom to hospitalization, median(IQR)	10(6-17)	13(7-25.50)	0.076
Age, median(IQR)	60(51-67)	63(57-70)	0.030
Male gender, n(%)	169(57.09%)	23(41.82%)	0.052
Heart rate, median(IQR), bpm	85(78-99)	82(77-95)	0.381
Respiratory rate, median(IQR), bpm	20(19-22)	20(20-22)	0.442
DBP, median(IQR), mmHg	80(72-88)	78(70-85)	0.348
SBP, median(IQR), mmHg	129(120-141)	124(115-138)	0.252
Fever, n (%)	235(79.39%)	42(76.36%)	0.745
Cough, n (%)	193(65.20%)	38(69.09%)	0.687
Fatigue, n (%)	91(30.74%)	11(20.00%)	0.147
Dyspnea, n (%)	96(32.43%)	11(20.00%)	0.093
<b>Comorbidities on admission</b>			
COPD, n (%)	5(1.69%)	0(0.00%)	1.000
Cerebrovascular diseases, n (%)	13(4.39%)	0(0.00%)	0.234
Chronic liver disease, n (%)	10(3.38%)	1(1.82%)	1.000

Hypertension, n (%)	113(38.18%)	20(36.36%)	0.918
Coronary heart disease, n (%)	23(7.77%)	4(7.27%)	1.000
Chronic renal diseases, n (%)	20(6.76%)	0(0.00%)	0.053
<b>Chest CT on admission</b>			
Unilateral lesion, n (%)	28(9.46%)	1(1.82%)	0.063
Bilateral lesions, n (%)	237(80.07%)	46(83.64%)	0.668
<b>Laboratory examination on admission</b>			
Leukocyte count > 9.5, 10^9/L, n/N (%)	61/292(20.89%)	7/55(12.73%)	0.225
Neutrophil count > 6.3, 10^9/L, n/N (%)	84/292(28.77%)	11/55(20.00%)	0.241
C-reactive protein > ULN, n/N (%)	72/117(61.54%)	18/34(52.94%)	0.483
ALT > 40 U/L, n/N (%)	72/262(27.48%)	9/55(16.36%)	0.121
AST > 40 U/L, n/N (%)	78/262(29.77%)	12/55(21.82%)	0.306
Urea > ULN, n/N (%)	39/291(13.40%)	3/54(5.56%)	0.164
Creatinine > ULN, n/N (%)	32/292(10.96%)	4/54(7.41%)	0.587
Blood glucose, mmol/L, median (IQR)	7.51(6.41-9.09)	9.27(7.16-14.05)	<0.001
LDL-c > ULN, n/N (%)	27225(12.00%)	6/49(12.24%)	1.000
TC > ULN, n/N (%)	20/242(8.26%)	7/49(14.29%)	0.184
hs-CRP > ULN, n/N (%)	216/251(86.06%)	33/40(82.50%)	0.725

Procalcitonin > ULN, n/N (%)	126/242(52.07%)	23/50(46.00%)	0.531
D-dimer > ULN, n/N (%)	171/282(60.64%)	27/52(51.92%)	0.307
Lymphocyte count < 1.1, 10^9/L, n/N (%)	171/292(58.56%)	20/55(36.36%)	0.004
SpO2 ≤ 93%, n/N (%)	71/229(31.00%)	8/45(17.78%)	0.107

#### **Management during hospitalization**

Oxygen inhalation, n (%)	263(88.85%)	46(83.64%)	0.385
Immunoglobulin, n (%)	70(23.65%)	7(12.73%)	0.105
Invasive ventilation, n (%)	65(21.96%)	4(7.27%)	0.020
Noninvasive ventilation, n (%)	80(27.03%)	5(9.09%)	0.007
Renal replacement therapy, n (%)	14(4.73%)	2(3.64%)	1.000
ICU treatment, n (%)	69(23.31%)	11(20.00%)	0.717
Antiviral drug, n (%)	125(42.23%)	43(78.18%)	<0.001
Antibiotics drug, n (%)	110(37.16%)	35(63.64%)	<0.001
Traditional Chinese medicine (%)	141(47.64%)	42(76.36%)	<0.001
Anti-hypertensive drug, n (%)	59(19.93%)	29(52.73%)	<0.001
Lipid-lowering drug, n (%)	12(4.05%)	14(25.45%)	<0.001
Hypoglycemic drugs, n (%)	0(0.00%)	55(100.00%)	<0.001

Vasoactive drug, n (%)	7(2.36%)	6(10.91%)	0.008
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29      **Notes:**  $P < 0.05$  was considered significant.

30      **Abbreviations:** IQR, interquartile range; bpm, beats per minute; DBP, diastolic blood pressure; SBP, systolic blood pressure; COPD, chronic  
31      obstructive pulmonary disease; CT, computed tomography; ULN, upper limit of normal; ALT, alanine aminotransferase; AST, aspartate  
32      aminotransferase ; LDL-c, low-density lipoprotein cholesterol; TC, total cholesterol; hs-CRP, high-sensitivity C-reactive protein; ICU, intensive care  
33      unit.

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35 **Table S5. Number of newly-diagnosed diabetes patients using insulin or insulin plus oral hypoglycemic agents.**

<b>Patients using insulin (N=34)</b>	<b>N</b>	<b>Specific hypoglycemic agents</b>
Concomitant use of insulin and three types of oral hypoglycemic drugs	2	Insulin, Metformin, Sulfonylureas and Glycosidase inhibitors
	4	Insulin, Metformin and Glycosidase inhibitors
Concomitant use of insulin and two types of oral hypoglycemic drugs	1	Insulin, Metformin and Sulfonylureas
	1	Insulin, Nateglinide and Glycosidase inhibitors
Concomitant use of insulin and one type of oral hypoglycemic drug	6	Insulin and Metformin
	4	Insulin and Glycosidase inhibitors
Use only insulin	16	insulin

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**Table S6. Number of newly-diagnosed diabetes patients using specific oral hypoglycemic agents.**

<b>Patients using oral hypoglycemic drugs (N=21)</b>	<b>N</b>	<b>Specific oral hypoglycemic drugs</b>
Concomitant use of three types of hypoglycemic drugs	1	Metformin, Nateglinid and Sulfonylureas
	4	Sulfonylureas and Glycosidase inhibitors
Use two types of hypoglycemic drugs	3	Metformin and Glycosidase inhibitors
	1	Metformin and Sulfonylureas
	1	Sulfonylureas and Glycosidase inhibitors
	2	Dpp4 inhibitor
	3	Metformin
Use one type of hypoglycemic drug	1	Nateglinide
	1	Sulfonylureas
	4	Glycosidase inhibitors

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**Table S7. Death number in newly-diagnosed diabetes patients using specific hypoglycemic agents**

<b>Hypoglycemic agent users with newly diagnosed diabetes (N=55)</b>	<b>Specific hypoglycemic agents</b>	<b>Death (N)</b>
16	Insulin	1
21	Oral hypoglycemic drugs	0
18	Insulin + oral hypoglycemic drugs	0

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Figure S1

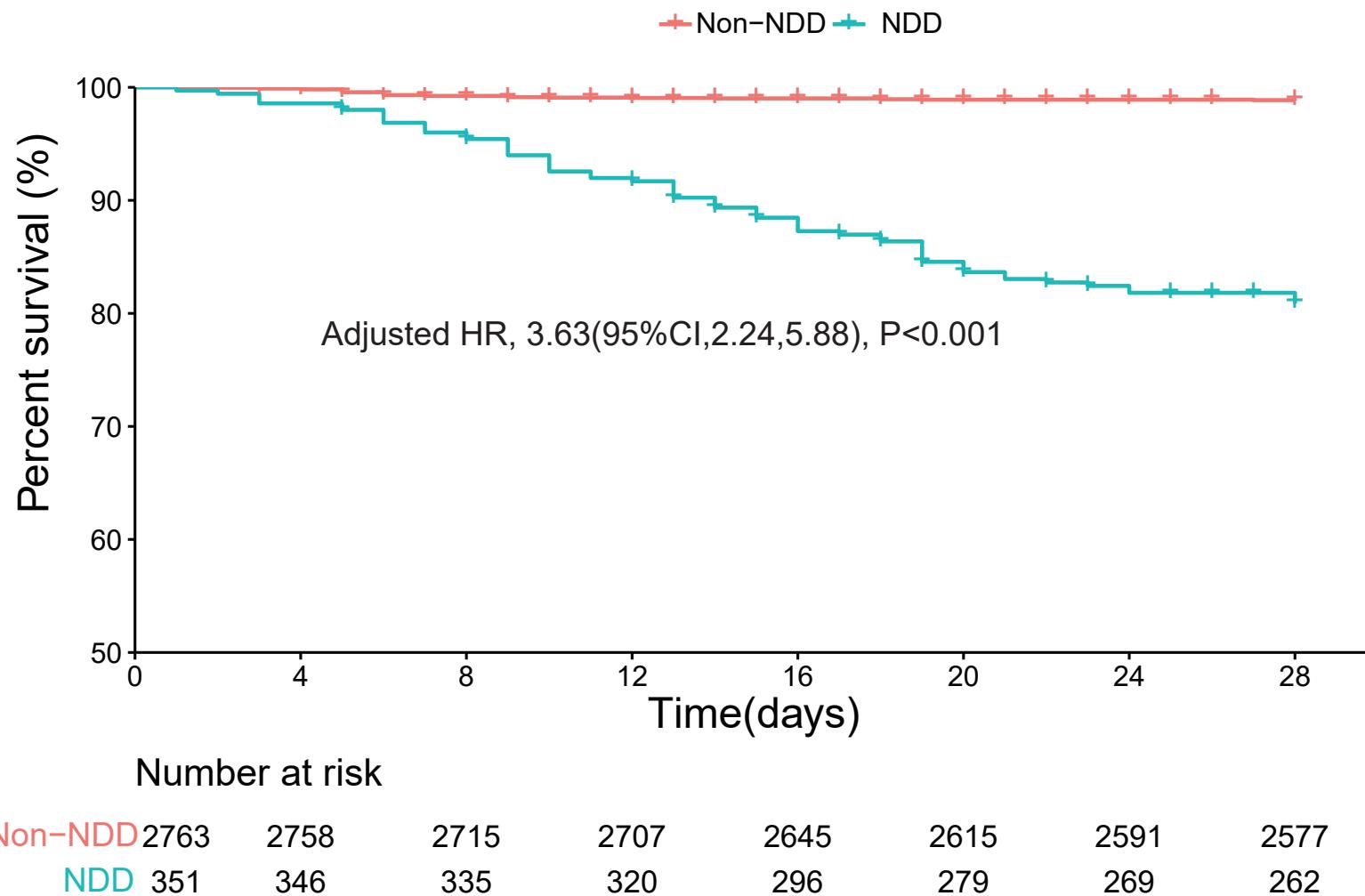


Figure S2

