Dugoročne posljedice niske porođajne mase u bolesnika sa zatajivanjem srca

Long term effects of low birth weight in heart failure patients

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UVOD: U našem ranijem istraživanju skupine bolesnika nakon transplantacije srca pokazali smo da bolesnici s dilatacijskom kardiomiopatijom nakon preboljelog miokarditisa (DCMyc) imaju nižu prosječnu porođajnu masu (Pm) u odnosu na druge skupine bolesnika sa zatajivanjem srca (ZS). Nadalje, Pm je negativno korelirala s razinama NT-proBNP-a i pozitivno korelirala s ehokardiografskim indeksom sfericiteta lijeve klijetke (LK). Ti podatci su bili temelj za veće opservacijsko istraživanje na razini našeg centra o mogućim dugoročnim posljedicama intrauterinog zaostajanja u rastu (IUGR).

PACIJENTI I METODE: Tijekom 2012. i 2013. godine 628 bolesnika s različitim uzrocima ZS hospitalizirano je u našem centru. Podatci o Pm su bili dostupni za 130 bolesnika koji su time uvršteni u istraživanje. Bolesnici su raspoređeni u skupine prema etiologiji ZS (tablica 1). Svim bolesnicima je učinjen kompletan ehokardiografski pregled, a mjereni parametri su bili LVIDd, LVEDV, EF, E/E' i MVDecT. Za svakog bolesnika je izračunat i indeks sfericiteta LK kao omjer duljine LK od apeksa do mitralnog anulusa i maksimalne duljine LK u kratkoj osi (iz prikaza 4 šupljine). Zabilježene su i maksimalne razine NT-proBNP-a. Pm < 2500g je smatrana niskom Pm.

PURPOSE: In our previous studies we showed on cardiac transplant patients that postmyocarditic cardiomyopathy (CMP) patients have lower average birth weights (BW) compared to other HF etiologies, and that BW negatively correlates with NT-proBNP and positively correlates with echocardiographic sphericity index (SPHI) of left ventricle (LV). Obtaining those data was a basis for a larger single center observational study on potential long-term effects of low birth weight (LBW).

PATIENTS AND METHODS: During 2012 and 2013 a total of 628 adult patients (pts) with different causes of HF were hospitalized in our Centre. We obtained BW data for 130 pts, included those in our study. The pts were categorized according to the CMP etiology (Table 1). All pts underwent a full echocardiographic study from which we extracted LVIDd (left ventricular end-diastolic diameter), LVEDV (left ventricular enddiastolic volume), and biplane EF (ejection fraction), as well as E/E' (relationship between maximal values of passive mitral inflow and lateral early diastolic mitral annular velocities) and MVDecT (mitral valve deceleration time). SPHI of LV was calculated as base-to-apex length/maximum short axis diameter in the apical 4 chamber view. We also sought to obtain NT-proBNP values for pts in our study.

TABLE 1. Birth weight, NTproBNP, left ventricular morphology, parameters of systolic and diastolic function, and SPHI among patient subgroups.

	BW	NTproBNP	LVIDd	EF	LVEDV	E/E'	MVDecT	SPHI
iDCM	3547.0±846	5780±5734	7.27±0.94	24.5±7.3	259.7±87	19.4±10	133±52	1.3±0.1
DCMyc	3135.9 ±743	6216±3879	6.88±1.1	28.6±8.4	219.4±96	13.3±7	173.5±90	1.4±0.2
ICM	3543.2 ±852	3473±3708	6.82±0.9	30.0±8.7	232.4±84	14.5±6	156±50	1.5±0.2
sDCM	3763 ±568	2695±2098	6.58±1.1	31.9±6.3	211.7±92	16.1±10	148.8±57	1.6±0.2
ARVD	3930 ±980	1719±1027	4.58±0.35	72.5±6.5	95±19	14±5	338±107	2.5±0.3
HCM	3414 ±250	1487±2033	5.14±0.6	50.8±20.8	126±34	11±6	166.5±30	1.8±0.3

iDCM=idiopathic dilated cardiomyopathy; DCMyc=postmyocarditic dilated cardiomyopathy; ICM=ischemic cardiomyopathy; sDCM=other secondary cardiomyopathies; ARVD=arrhythmogenic dysplasia of right ventricle; HCM=hypertrophic cardiomyopathy; BW=birth weight; NTproBNP=N-terminal brain type natriuretic peptide; LVIDd=left ventricular end-diastolic diameter; EF=ejection fraction; LVEDV=left ventricular enddiastolic volume; E/E'=relationship between maximal values of passive mitral inflow and lateral early diastolic mitral annular velocities; MVDecT=mitral valve deceleration time; SPHI=left ventricular sphericity index.

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REZULTATI: Bolesnici s DCMyc su imali najnižu prosječnu Pm, a bila je statistički značajno niža nego u skupini bolesnika s idiopatskom dilatacijskom kardiomiopatijom i ishemijskom sekundarnom kardiomiopatijom. Nadalje, vrijednosti NTproBNP-a su u bolesnika s niskom Pm u svim skupinama bile statistički značajno više nego bolesnika s normalnom Pm. Ehokardiografski parametri pokazuju, s druge strane, da indeks sfericiteta LK ima slabu negativnu korelaciju s vrijednostima NTproBNP-a u bolesnika s normalnom Pm ($r=-0.19$, $p=0.02$), dok ima umjerenu do jaku negativnu korelaciju u bolesnika s niskom Pm ($r=-0.49$, $p=0.03$).

ZAKLJUČAK: U ovoj studiji smo na uzorku bolesnika sa ZS iz našeg Centra potvrdili da je niska Pm češća u bolesnika s DCMyc. Uspostavljena je umjerena do jaka korelacija sfericiteta LK i vrijednosti NTproBNP-a u bolesnika s niskom Pm i ZS. Ovi rezultati naglašavaju ulogu dugoročnih posljedica IUGR.

RESULTS: Postmyocarditic CMP group of pts had the lowest average BWs, and their BWs were significantly lower than average BWs in iDCM and ICM groups. Furthermore, maximum BNP values among all LBW pts were significantly higher than maximum BNP values among all normal BW patients. Considering the echocardiographic LV morphology measures, the SPHI had a negative weak correlation with BNP values in normal BW pts ($r=-0.19$, $p=0.02$), but moderate to strong negative correlation in LBW pts ($r=-0.49$, $p=0.03$).

CONCLUSION: In this study, we have confirmed on a larger number of pts that LBW is more prevalent in postmyocarditic pts and may be a relevant cause of HF. Importantly, we established a moderate to strong correlation between LV shape and BNP values among LBW HF patients. These data emphasize the potential long term effects of intrauterine growth restriction.

LITERATURE

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